Vol. 1068 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

July 8, 1986

U.S.
DEPARTMENT
OF COMMERCE

Patent
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Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

July 8, 1986 Volume 1068 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Feb. 9, 1986 and is announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

International PCT fees have been changed effective Jan. 1, 1986 and were announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

Note that the amount of the international search fee for the European Patent Office and the amounts of the International PCT fees will change effective June 1, 1986. For information on these fee changes see the notice appearing in the *Official Gazette* at 1065 O.G. 41 on Apr. 29, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before June 1, 1986	830.00
if paid on or after June 1, 1986	930.00
International fees	
Basic fee (first 30 pages):	
if paid before June 1, 1986	325.00
if paid on or after June 1, 1986	375.00
Basic Supplemental fee (for each page over 30):	
if paid before June 1, 1986	6.00
if paid on or after June 1, 1986	7.00
Designation fee for the first 10 national or regional offices:	
if paid before June 1, 1986	80.00
if paid on or after June 1, 1986	90.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Mar. 31, 1986.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on July 5, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,390,994 through 4,392,256
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED APRIL 20, 1986, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,325,181	06/217,306	4/20/82
4,325,210	06/217,718	4/20/82
4,325,246	06/268,601	4/20/82
4,325,256	06/216,567	4/20/82
4,325,323	06/218,545	4/20/82
4,325,370	06/254,141	4/20/82
4,325,379	06/217,432	4/20/82
4,325,481	06/223,344	4/20/82
4,325,503	06/225,971	4/20/82
4,325,745	06/231,827	4/20/82
4,325,746	06/235,813	4/20/82
4,325,767	06/241,414	4/20/82
4,325,799	06/242,544	4/20/82
4,325,876	06/221,179	4/20/82
4,325,882	06/219,742	4/20/82
4,325,949	06/219,750	4/20/82
4,325,963	06/217,526	4/20/82
4,326,042	06/256,360	4/20/82
4,326,050	06/249,799	4/20/82
4,326,070	06/235,257	4/20/82
4,326,081	06/237,326	4/20/82
4,326,231	06/245,501	4/20/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,965,197, Re. S.N. 857,242, Filed Apr. 29, 1986, Cl. 568/56, PROCESS FOR THE COMPLETE BROMINATION OF NON-FUSED RING AROMATIC COMPOUNDS, Heinrich Stepniczka, Owner of Record: *Great Lakes Corp., West Lafayette, Ind.,* Attorney or Agent: Daniel W. Vittum, Jr., et al., Ex. Gp.: 122

4,387,849, Re. S.N. 842,486, Filed Mar. 21, 1986, Cl. 239/006, METHOD FOR DISPENSING AT A VISIBLY DETECTABLE RATE, CONTINUOUSLY OR DISCONTINUOUSLY, FOR DISCREET PERIODS OF TIME AT A STEADY RATE, A VOLATILE COMPOSITION OF (ETC), Augustinus G. Van Loveren, et al., Owner of Record: *International Flavors & Fragrances, Inc., New York, N.Y.,* Attorney or Agent: Arthur L. Liberman, Ex. Gp.: 313

4,431,160, Re. S.N. 829,375, Filed Feb. 13, 1986, Cl. 251/86, ELECTRIC CONTROL VALVE, David L. Burt, et al., Owner of Record: *Allied Corp., Southfield, Mich.,* Attorney or Agent: Markell Seitzman, Ex. Gp.: 347

4,435,953, Re. S.N. 837,727, Filed Mar. 10, 1986, Cl. 057/408, OPENING ROLLER UNIT FOR OPEN-END SPINNING INSTALLATIONS, Friedbert Schmid, et al., Owner of Record: *Said Assor to Hans Stahlecker, Sussen, Germany,* Attorney or Agent: Jerry E. Hyland, et al., Ex. Gp.: 245

4,451,270, Re. S.N. 848,032, Filed Apr. 1, 1986, Cl. 55/38, ABSORPTION PROCESS FOR PRODUCING OXYGEN AND NITROGEN AND SOLUTION THEREFOR, Ian C. Roman, Owner of Record: *Bend Research, Inc., Bend, Ore.,* Attorney or Agent: Dennis E. Stenzel, Ex. Gp.: 135

4,490,052, Re. S.N. 858,730, Filed May 2, 1986, Cl. 368/292, WATCHCASE, Paul Gogniat, Owner of Record: *Montres Rado S.A., Lorgeau, Switzerland,* Attorney or Agent: Peter L. Berger, et al., Ex. Gp.: 217

4,542,356, Re. S.N. 849,527, Filed Apr. 8, 1986, Cl. 333/195, HIGH FREQUENCY NARROW-BAND MULTIMODE FILTER, Yuzo Nakazawa, et al., Owner of Record: *Toyo Communication Equipment Co., Kanagawa, Japan,* Attorney or Agent: W. Robert Spensley, Ex. Gp.: 252

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Department of the Treasury United States Customs Service Application for Recordation of Trade Name: "THE BALTIMORE LUGGAGE COMPANY"

Agency: U.S. Customs Service, Department of the Treasury

Action: Notice of Application for Recordation of Trade Name

Summary: Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "THE BALTIMORE LUGGAGE COMPANY" used by The Baltimore Luggage Company, a corporation organized under the laws of the State of Rhode Island, located at 1919 Annapolis Rd., Baltimore, Md. 21230.

The application states that the trade name is used in connection with the following merchandise manufactured in Taiwan: vinyl luggage; nylon luggage; vinyl attaches; leather attaches; jute luggage; attaches; and luggage carts.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name. Notice of the action taken on the application for recordation of this trade name will be published in the Federal Register.

Date: Comments must be received on or before Aug. 1, 1986.

Address: Written comments should be addressed to the Commissioner of Customs, Attention: Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229.

For Further Information Contact: Beatrice Moore, Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

May 27, 1986.

MARILYN G. MORRISON,
Director, Entry Procedures and Penalties Division.

Patents Available for License or Sale

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to: General Electric Co., Motor Business Group, 1635 Broadway, P.O. Box 2204, Fort Wayne, Ind. 46801-2204, Attention: Patent Counsel.

3,973,601. APPARATUS AND METHOD FOR USE IN DEVELOPING WOUND COILS.
4,561,314. MAGNETOELASTIC FORCE/PRESSURE SENSOR.
4,570,333. METHOD OF MAKING A PERMANENT MAGNET ROTOR.

The inventions listed below owned by Bernhard Kirsch are available for licensing or sale. Please contact Bernhard Kirsch, Im Litzelholz 23, 5500 Trier, West Germany, or Beach & Brown, 3107 Eastlake Ave., East, Seattle, Wash. 98102, (202) 325-6789.

4,017,098. SAFETY BINDINGS FOR SKIS.
4,113,276. SKI BINDING AUTOMATICALLY RELEASABLE BY OVERSTRESS.
4,169,612. SKI BINDINGS.
4,173,084. SKI BOOTS.
4,226,439. SAFETY SKI-BINDINGS.
4,294,460. FOOT-PLATES FOR SKI-BINDINGS.
4,484,764. FRONT BINDINGS FOR SAFETY SKI BINDINGS.

Please direct inquiries to Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115-0514, (206) 524-2671.

4,433,547. TORQUE LEVELLER.
4,455,837. CYCLIC VELOX BOILER.
4,480,654. MULTIPRESSURE COMPRESSOR.
4,484,531. CYCLIC VELOX BOILER.
4,508,273. CROSSED PULSE LIQUID ATOMIZER.
4,509,957. CYCLIC CHAR GASIFIER.
4,533,362. CYCLIC CHAR GASIFIER WITH PRODUCT GAS DIVIDER.
4,537,603. CYCLIC CHAR GASIFIER DEVOLATILIZATION PROCESS.
4,530,705. CYCLIC GAS SEPARATOR.
4,568,265. CROSSED PULSE BURNER ATOMIZER.
4,568,361. CYCLIC CHAR GASIFIER OXIDATION PROCESS.
4,580,402. TORQUE LEVELLER AND GOVERNOR.
4,584,970. CYCLIC SOLID GAS REACTOR.

For information contact John F. A. Earley, Esq., Harding, Earley, Follmer & Frailey, 1910 Two Mellon Bank Center, Philadelphia, Pa., 19102, (215) 568-2606.

3,467,081. INFLATABLE MASSAGING MATTRESS.
3,467,124. FLUIDIC DEVICE.
3,536,519. WHISKERS.
3,547,064. PLANING STEP.
3,589,382. FLUIDICS.
3,615,258. MAKING FIBERS FROM ELECTROSTATICALLY CHARGED VAPOR.
3,616,068. APPARATUS FOR MAKING A BUILDING ELEMENT.
3,664,813. METHOD FOR MAKING GRAPHITE WHISKERS.
3,675,611. JET STEERING BOAT.
3,694,531. METHOD FOR MAKING HOLLOW CONCRETE PANELS.
3,745,919. RECORD CARD COMPARING AND PRINT ENABLING MECHANISM.
3,775,061. APPARATUS FOR MAKING FIBERS.
3,777,344. METHOD OF FABRICATING FLUIDIC ELEMENTS BY ASSEMBLING TOGETHER A PLURALITY OF PLASTIC STRIPS.
3,811,380. ROCKET AND PROPELLANT THEREFOR.
3,813,224. WHISKER OVEN AND METHOD.
3,915,663. WHISKER-REINFORCED METAL.
4,006,341. CARD COMPARING APPARATUS.
4,048,396. BATTERY PACKAGE.
4,093,067. MIXING PACKAGE.
4,205,408. BUILDING ELEMENT.
4,227,611. PACKAGE.
4,227,614. PACKAGES.
4,363,205. PACKAGING METHOD.
4,364,474. PACKAGES.
4,434,820. SYRINGE LOADER AND METHOD.
4,527,687. PACKAGE.
4,537,308. PACKAGES.

4,231,061. INSTANT COLOR SLIDE RECORDER OF CRT IMAGE. *Samuel Freeman,* 13 Birchwood Court East, Syosset, N.Y. 11791.
4,464,027. BINOCULAR TRAINER. *Cliff Cooper,* P.O. Box 66035, Washington, D.C. 20035.
4,557,471. MEDICAL BED. *Norbert Pazzini,* 31340 Villemur sur Tarn, France.
4,581,135. SELF-CLEANING FLUID FILTER WITH A DRAIN. *Henry C. Kovar,* P.O. Box 571, Anoka, Minn. 55303, (612) 421-6120.
4,583,956. RIGID AND TELESCOPING STRUT MEMBERS CONNECTED BY FLEXIBLE TENDONS. *William A. Nelson,* 52 High St., Middlebury, Vt. 05753.

SN. 692,342. MINI MAC. *Ernesto MacNamara,* 5701 N.W. 110th St., Hialeah, Fla. 33012.

Patent Terms Extended Under 35 U.S.C. 155

Certificates extending the terms with respect to the following patents were issued under the provisions of 35 U.S.C. 155 on June 12, 1986. The owner of record of each of the patents is General Foods Corp. The term of each of the patents was extended 5 years, 10 months and 17 days. The period of extension applies to any product including or any process of using Aspartame (L-aspartyl-L-phenylalanine methyl ester) within the scope of the claims of these patents.

Patent No. 3,761,288, granted Sept. 25, 1973 to Martin Glicksman, et al.
Patent No. 3,829,588, granted Aug. 13, 1974 to Thomas P. Finucane, et al.
Patent No. 3,868,465, granted Feb. 25, 1975 to Ivan Furda, et al.
Patent No. 3,868,472, granted Feb. 25, 1975 to Jeffrey H. Berg, et al.
Patent No. 3,922,369, granted Nov. 25, 1975 to Martin Glicksman, et al.
Patent No. 3,928,633, granted Dec. 23, 1975 to Myron D. Shoaf, et al.
Patent No. 3,934,047, granted Jan. 20, 1976 to Hans Robert Schade.
Patent No. 3,934,048, granted Jan. 20, 1976 to Ivan Furda, et al.
Patent No. 3,939,289, granted Feb. 17, 1976 to John Hornyak, et al.
Patent No. 3,947,600, granted Mar. 30, 1976 to Patrick M. Rousseau.
Patent No. 3,955,000, granted May 4, 1976 to Patricia A. Bagerly.
Patent No. 3,956,507, granted May 11, 1976 to Myron D. Shoaf, et al.
Patent No. 3,943,258, granted Mar. 9, 1976 to Bernard J. Bahoshy, et al.
Patent No. 3,962,468, granted June 8, 1976 to LaMonte D. Pischke, et al.

Patent No. 3,965,273, granted June 22, 1976 to Howard D. Stahl.
Patent No. 3,971,857, granted July 27, 1976 to Ivan Fruda.
Patent No. 3,982,023, granted Sept. 21, 1976 to Bernard J. Bahoshy, et al.
Patent No. 4,001,456, granted Jan. 4, 1977 to Martin Glicksman, et al.
Patent No. 4,004,039, granted Jan. 18, 1977 to Myron D. Shoaf, et al.
Patent No. 4,007,288, granted Feb. 8, 1977 to Martin Glicksman.
Patent No. 4,009,291, granted Feb. 22, 1977 to William A. Mitchell, et al.
Patent No. 4,009,292, granted Feb. 22, 1977 to Thomas P. Finucane.
Patent No. 4,031,259, granted June 21, 1977 to Joaquin Castro Lugay, et al.
Patent No. 4,036,992, granted July 19, 1977 to Bernard J. Bahoshy, et al.
Patent No. 4,059,706, granted Nov. 22, 1977 to LaMonte D. Pischke, et al.
Patent No. 4,079,151, granted Mar. 14, 1978 to Hans R. Schade, et al.
Patent No. 4,122,195, granted Oct. 24, 1978 to Bernard J. Bahoshy, et al.
Patent No. 4,139,639, granted Feb. 13, 1979 to Bernard J. Bahoshy, et al.
Patent No. 4,143,170, granted Mar. 6, 1979 to Thomas P. Finucane.
Patent No. 4,246,286, granted Jan. 20, 1981 to Robert E. Klose, et al.
Patent No. 4,277,464, granted July 7, 1981 to George H. Reussner, et al.

PATENT NOTICES

Certificates of Correction for the Week of July 8, 1986

B1. 4,268,915	4,548,379	4,568,561	4,576,128
Re. 31,848	4,548,869	4,568,578	4,576,235
Re. 32,073	4,551,599	4,568,712	4,576,302
D. 282,582	4,551,957	4,568,858	4,576,338
4,182,763	4,551,976	4,569,094	4,576,837
4,276,661	4,552,001	4,569,426	4,576,947
4,293,472	4,553,193	4,569,494	4,577,032
4,322,812	4,554,694	4,569,619	4,577,316
4,410,826	4,554,853	4,569,780	4,577,379
4,464,247	4,555,330	4,569,926	4,577,387
4,472,050	4,555,344	4,570,001	4,577,707
4,474,459	4,556,003	4,570,132	4,577,748
4,483,511	4,556,383	4,570,257	4,577,859
4,489,450	4,556,738	4,570,629	4,577,944
4,499,361	4,557,799	4,570,703	4,578,273
4,507,355	4,557,926	4,570,726	4,578,621
4,509,412	4,558,135	4,570,823	4,578,770
4,510,944	4,558,735	4,570,904	4,578,778
4,512,340	4,558,774	4,571,594	4,578,841
4,513,747	4,558,911	4,571,777	4,578,855
4,514,688	4,559,288	4,572,265	4,578,949
4,515,500	4,559,745	4,572,436	4,579,065
4,517,699	4,561,149	4,572,442	4,579,234
4,517,872	4,561,444	4,572,989	4,579,247
4,518,663	4,562,369	4,573,269	4,579,462
4,525,065	4,563,530	4,573,272	4,579,563
4,527,050	4,563,718	4,573,734	4,580,521
4,532,854	4,564,515	4,573,858	4,580,623
4,533,854	4,564,662	4,573,938	4,580,899
4,533,920	4,564,926	4,573,993	4,581,439
4,535,074	4,565,409	4,574,035	4,581,846
4,536,672	4,565,518	4,574,267	4,581,850
4,536,876	4,565,641	4,574,538	4,582,303
4,541,271	4,565,708	4,574,550	4,583,437
4,542,865	4,566,585	4,574,597	4,583,826
4,542,985	4,567,014	4,574,764	4,583,910
4,545,692	4,567,015	4,574,889	4,584,238
4,545,871	4,567,020	4,574,896	4,584,366
4,546,154	4,567,203	4,574,924	4,585,634
4,546,305	4,567,305	4,575,377	4,585,875
4,547,646	4,567,931	4,575,839	

Disclaimers

Des. No. 283,489.—*James T. Stevens,* San Antonio, Tex. PACKAGING CONTAINER FOR AN ELECTRICAL SWITCH. Patent dated Apr. 22, 1986. Disclaimer filed Apr. 11, 1986, by the assignee, *Power Controls Corp.*

The term of this patent subsequent to Dec. 3, 1999, has been disclaimed.

4,306,951.—*Steven W. Depp* and *Kurt E. Petersen,* San Jose, Calif. ELECTROCHEMICAL ETCHING PROCESS FOR SEMICONDUCTORS. Patent dated Dec. 22, 1981. Disclaimer filed Apr. 24, 1986, by the assignee, *International Business Machines Corp.*

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

Dedication

4,248,990.—*Edwin Thomas Pieski,* Fairfax and *Thomas Fujio Sashihara,* Wilmington, Del. NONRANDOM COPOLYMERS OF ETHYLENE AND UNSATURATED ACID. Patent dated Feb. 3, 1981. Dedication filed May 6, 1986, by the assignee, *E. I. Du Pont de Nemours and Co.*

Hereby dedicates to the Public the entire remaining term of said patent.

Disclaimers and Dedications

3,552,303.—*Douglas R. Parrish,* Los Angeles, Calif. CAKE PAN ASSEMBLY. Patent dated Jan. 5, 1971. Disclaimer and Dedication filed Mar. 17, 1986, by the assignee, *The Pillsbury Co.*

Hereby disclaims and dedicates said patent to the Public.

3,801,247.—*Douglas R. Parrish,* Anaheim and *Richard A. Parrish,* Costa Mesa, Calif. UNIVERSAL COUPLER FOR CAKE ICING DECORATING TUBES. Patent dated Apr. 2, 1974. Disclaimer and Dedication filed Mar. 17, 1986, by the assignee, *The Pillsbury Co.*

Hereby disclaims and dedicates said patent to the Public.

3,847,523.—*Douglas R. Parrish,* Anaheim and *Richard A. Parrish,* Costa Mesa, Calif. UNIVERSAL COUPLER FOR CAKE ICING DECORATING TUBES. Patent dated Nov. 12, 1974. Disclaimer and Dedication filed Mar. 17, 1986, by the assignee, *The Pillsbury Co.*

Hereby disclaims and dedicates said patent to the Public.

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	Columbus: Ohio State University Libraries	(614) 422-6286
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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF June 7, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-01-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-01-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	10-12-84
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	4-18-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-28-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	2-01-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-28-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	9-26-83
DESIGN, GROUP 290—K. L. CAGE, Director	2-06-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	12-24-84
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	8-18-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-25-84
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	7-01-85

Expiration of patents: The patents within the range of numbers indicated below expire during June 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,447,160 to 3,452,361, inclusive

Plant Patents ..... Numbers 2,890 to 2,896 inclusive

REISSUES

JULY 8, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,197

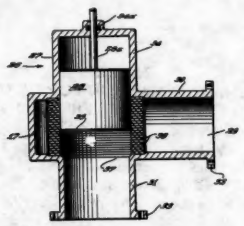
HIGH ENERGY LOSS FLUID CONTROL

Richard E. Self, Los Alamitos, Calif., assignor to Control Components, Inc., Irvine, Calif.

Original No. 3,514,074, dated May 26, 1970, Ser. No. 730,978, May 6, 1968. Continuation of Ser. No. 809,645, Aug. 24, 1977, abandoned, which is a continuation-in-part of Ser. No. 599,229, Dec. 5, 1966, Pat. No. 3,451,404. Application for reissue Sep. 15, 1982, Ser. No. 418,435

Int. Cl.[2] **F15d** *1/04*

U.S. Cl. 251—127 **41 Claims**



1. In a high energy loss flow control [device] *valve including a reciprocal valve plug to regulate the quantity of fluid flowing therethrough* for installation in a fluid transfer system where a potentially destructive or noise generating fluid pressure differential exists *such that heretofore cavitation, erosion and severe noise will occur*:

a rigid structure comprising a stack of members having abutting faces enclosing therebetween a plurality of individual passageway grooves angular between inlet and outlet ends thereof to turn the fluid and provide a substantially longer fluid flow length than the distance between the inlet and outlet ends thereof, and each passageway groove having an effective long length to diameter ratio cooperating with the angular turn-inducing configuration thereof to impart high frictional resistance losses to fluid flow therethrough *to a degree that damaging cavitation, erosion and severe noise do not occur in said passageways*; and

means for compelling flow of the fluid through said passageways whereby potential energy will be dissipated and velocity of the fluid will be controlled[.], *said plug being in slidable contact with said stack of members, said inlet ends being positioned relative to said plug so they are selectively opened and closed to flow by the reciprocal action of said plug.*

Re. 32,198

TRUCK BED LINER

Michael Wayne, Bloomfield Hills, Mich., assignor to Durakon, Inc., Lapeer, Mich.

Original No. 4,341,412, dated Jul. 27, 1982, Ser. No. 143,075, Apr. 24, 1980. Application for reissue Apr. 9, 1984, Ser. No. 597,973

Int. Cl.[4] **B62D** *33/02*

U.S. Cl. 296—39 R **15 Claims**

8. A protective liner for a truck bed structure having a floor, a front wall, and opposed side walls, the truck bed side walls and floor forming a rearward access opening, said liner comprising:

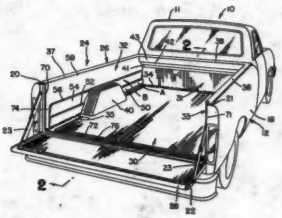
a liner member adapted to be inserted in the truck bed, said liner member having a bottom wall, a front wall, and opposed side walls;

longitudinally extending bend portions connecting each said liner side wall with said liner bottom wall;

each said liner side wall including a plurality of vertically spaced panels;

each panel including a longitudinally extending side rail;

said liner side walls characterized in that the panels providing strength to resist longitudinal bending stresses while the longitudinally extending panel side rails being operative to absorb cargo impact and frictional forces;



each said panel including a riser portion and a tread portion extending from the upper terminus of its associated riser portion, the juncture of each panel riser and tread portion defining its longitudinally extending side rail; and

each liner side wall tread portion defining a flexing juncture permitting limited bending of the side wall.

Re. 32,199

TOUGH, STABLE TETRAFLUOROETHYLENE-FLUOROALKYL PERFLUOROVINYL ETHER COPOLYMERS

Dana P. Carlson, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 3,642,742, dated Feb. 15, 1972, Ser. No. 818,391, Apr. 22, 1969. Application for reissue Feb. 27, 1985, Ser. No. 706,313

Int. Cl.[4] **C08F** *214/26*

U.S. Cl. 526—206 **6 Claims**

1. A process for forming a polymer of tetrafluoroethylene monomer and at least one fluorovinylether monomer copolymerizable therewith which comprises polymerizing tetrafluoroethylene with fluorovinyl ethers selected from the group consisting of

(a) fluorovinyl ethers having the general formula

$$XCF_2(CF_2)_nOCF{=}CF_2$$

(b) fluorovinyl polyethers having the general formula

$$XCF_2(CF_2)_nOCF(CF_3)CF_2OCF{=}CF$$

where X=F or H and n=0–7, and

(c) perfluoro-3,6-dioxa-4-methyl-7-octene sulfonyl fluoride, in a liquid solvent selected from the class consisting of (a) perfluorinated solvents (b) chlorofluoroalkanes in which each carbon atoms has at least one fluorine atom attached thereto and (c) chlorofluorohydroalkanes in which each carbon atom has at least one fluorine atom attached thereto and which may contain a maximum of one hydrogen atom per carbon atom if the hydrogen atom is present only in the difluoromethyl (CF_2H) grouping, at a temperature in the range from 30° C. to about 75° C. and at

pressures in the range of from about 15 to about 1000 p.s.i.g.,

in the presence of a hydrogen-containing chain transfer agent selected from the group consisting of methanol, isopropanol, and ethanol thereby to provide a copolymer having stable hydride end groups.

Re. 32,200

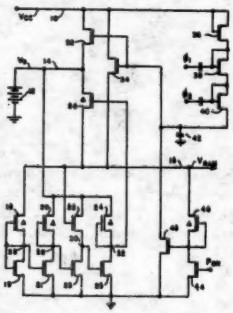
MOS BATTERY BACKUP CONTROLLER FOR MICROCOMPUTER RANDOM ACCESS MEMORY

Yong K. Lee, Mountain View; Joseph Domitrowich, Half Moon Bay, and James S. Gordon, Sunnyvale, all of Calif., assignors to Fairchild Semiconductor Corporation, Cupertino, Calif.

Original No. 4,384,350, dated May 17, 1983, Ser. No. 203,182, Nov. 3, 1980. Application for reissue Mar. 5, 1984, Ser. No. 586,172

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—229 **4 Claims**



4. MOS microcomputer system computer control circuitry for maintaining memory sustaining voltage to a static random access memory upon failure of the system to maintain a V_{cc} level, said control circuitry comprising:

(a) input means for connecting an external battery to said control circuitry;

(b) a MOS voltage comparator coupled to said input means and to a V_{cc} conductor, said comparator generating an output signal when the V_{cc} level drops by a predetermined amount wherein said voltage comparator comprises:

(i) a voltage divider including first and second MOS transistors coupled in series between the V_{cc} conductor and ground reference, the gates of said first and second transistors being coupled together and to the interconnection of said first and second transistors;

(ii) an inverter circuit including third and fourth MOS transistors coupled in series, said third transistor being coupled to said input means and said fourth transistor being coupled to ground reference, the gate of said third transistor being coupled to the interconnection of said third and fourth transistors and the gate of said fourth transistor being coupled to the interconnection of said first and second transistors;

(iii) a buffer circuit including fifth and sixth series MOS transistor, said fifth transistor being coupled to said input means and said sixth transistor being coupled to ground reference, the gate of said fifth transistor being coupled to V_{cc} and the gate of said sixth transistor being coupled to the interconnection of said third and fourth transistors, the output of said buffer circuit being at the interconnection of said fifth and sixth series transistors; and

(iv) a second inverter circuit including seventh and eighth series MOS transistors, said seventh transistor coupled to said input means and said eighth transistor coupled to said ground reference, the gate of said eighth transistor being coupled to the interconnection of said sixth and seventh transistors, the interconnection between said seventh and eighth transistors providing the output of said second inverter circuit to said MOS gating circuitry; and

(c) MOS gating circuitry coupled to said input means, to said V_{cc} conductor, and to the output conductor and responsive to the output signal of said comparator for coupling said V_{cc} conductor to said output conductor when the voltage level on said V_{cc} conductor remains at least as high as the voltage level of said input means, and for disconnecting the coupling to said V_{cc} conductor and coupling said input means to said output conductor upon a lowering of said V_{cc} by a predetermined amount.

Re. 32,201

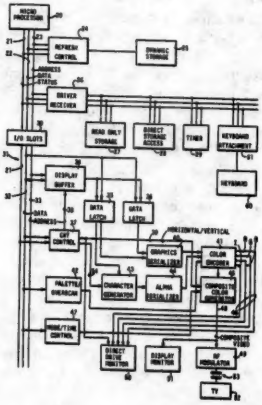
APPARATUS AND METHOD FOR READING AND WRITING TEXT CHARACTERS IN A GRAPHICS DISPLAY

David J. Bradley, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Original No. 4,408,200, dated Oct. 4, 1983, Ser. No. 292,084, Aug. 12, 1981. Application for reissue Aug. 6, 1984, Ser. No. 638,340

Int. Cl.⁴ G09G *1/28*

U.S. Cl. 340—747 **18 Claims**



10. A raster scan video display control apparatus of the type including a graphic video display refresh buffer operable in an all points addressable mode for refreshing said display with graphics data, a processor for writing graphics data into said display refresh buffer, and a character storage for storing the character dot patterns of a display character font, comprising means for selecting a character to be displayed, and means for loading from said storage into said graphic video display refresh buffer a character dot pattern corresponding to the character to be displayed and for reading a previously displayed character by comparing a character dot pattern previously loaded into said graphic video display buffer with successive character dot patterns selected from said character storage.

PLANT PATENTS

GRANTED JULY 8, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,760

ROSE PLANT NAMED BUCRED

Griffith J. Buck, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Nov. 19, 1984, Ser. No. 672,698
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—1 1 Claim

1. A new and distinct variety of rose plant substantially as herein shown and described, characterized by its profuse production of medium-size flowers of bright red coloration, its vigorous and free-branching growth habit, its ability to survive without protection under adverse winter conditions, and its resistance to foliar diseases.

5,761

APPLE TREE EARLEEGRANNEE STRAIN

Calvin L. Cooper, Rte. 1, Brewster, Wash. 98812

Filed Nov. 2, 1984, Ser. No. 667,555
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—34 1 Claim

1. A new and distinct variety of Granny Smith apple tree substantially as herein shown and described, characterized by its compact form and by the early maturing of its fruit with respect to the whiteness of its flesh, the loss of the characteristic (to Granny Smith apples) white spots from its skin, the development of skin of a lighter green color, and, in particular, by early and substantial rise in soluble solids content and early, rapid and substantial drop in total acidity.

5,762

CARNATION NAMED CASTELLARO

Giacomo Nobbio, Strada Villetta 5, San Remo, Imperia, Italy

Filed Apr. 16, 1984, Ser. No. 600,848
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—72 1 Claim

1. A new and distinct carnation variety, substantially as herein shown and described, characterized by the bright red coloration of its blooms and the deeply incised margins of the flower petals, the flowers being of the double type and borne singly on slender, erect stems.

5,763

CARNATION NAMED CANTALUPO

Giacomo Nobbio, Strada Villetta 5, San Remo, Imperia, Italy

Filed Apr. 16, 1984, Ser. No. 600,827
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—73 1 Claim

1. A new and distinct variety of carnation cultivar, substantially as herein shown and described, characterized by its large, double flower of bright red color, the color of the petals being of monchrome distribution, and the flowers being borne singly on strong, upright stems.

PATENTS

GRANTED JUL. 8, 1986

ERRATA

For CLASS	See PATENT NO.
128–132	4,598,458
411–345	4,598,652
242–035	4,598,869
280–250	4,598,945
384–045	4,598,956
384–051	4,598,957
623–002	4,599,081
522–008	4,599,155
048–210	4,599,160
530–405	4,599,197
558–313	4,599,202
558–170	4,599,205
558–085	4,599,206
558–137	4,599,207
365–189	4,599,688

PATENTS

GRANTED JULY 8, 1986

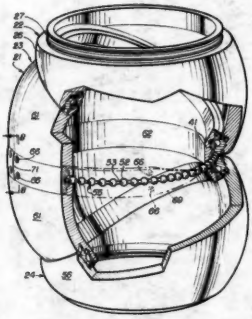
GENERAL AND MECHANICAL

4,598,427

ELBOW AND KNEE JOINT FOR HARD SPACE SUITS

Hubert C. Vykukal, Los Altos, Calif., assignor to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 20, 1984, Ser. No. 684,190
Int. Cl.[4] A62B *17/00*; F16L *11/18*
U.S. Cl. 2—2.1 A **29 Claims**



1. An articulated joint comprising rigid first, second and third sections serially arranged,

a first bearing with a central axis, said bearing being secured to adjacent ends of said first and second sections allowing relative rotation of said first and second sections around said axis,

a second bearing with a central axis, said second bearing being secured to adjacent ends of said second and third sections allowing relative rotation of said second and third sections around said axis of said second bearings,

and tying means for causing said first and third sections to rotate together relative to said second section, and in opposite direction to the rotation of the second section when all three sections rotate.

4,598,428

SHOULDER AND HIP JOINTS FOR HARD SPACE SUITS AND THE LIKE

Hubert C. Vykukal, Los Altos, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 20, 1984, Ser. No. 642,602
Int. Cl.[4] A62B *17/00*; B63C *11/04*
U.S. Cl. 2—2.1 A **40 Claims**

22. A space suit comprising a torso section having an opening, a limb section and an articulated joint connected at a first end to said torso section at said opening and a second end to said limb section, said articulated joint comprising

a covering of adjacent first and second rigid sections,

an end wall having oppositely directed first and second flanges,

a first bearing having a first race fixed for rotation with one said flange and a second race fixed for rotation with another said flange,

at least one said rigid section being rotatable relative to said end wall,

an elastomeric comfort ring located within said first and second rigid sections and means securing said comfort ring substantially stationary relative to said end wall,

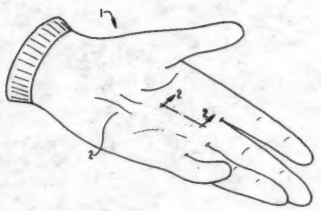
a first flexible section within one said rigid section, and means sealing an end of said flexible section to one said race.

4,598,429

PARTIALLY DETACKIFIED LEATHER AND GLOVE

Lewis W. Mulvaney, Ho-Ho-Kus, N.J., assignor to R. Neumann & Co., Hoboken, N.J.

Filed Nov. 14, 1984, Ser. No. 671,761
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—169 **2 Claims**



1. An adhesively tackified leather glove having an inner and an outer surface, wherein at least a portion of each of said inner and outer surfaces is adhesively tackified and wherein at least a portion of said adhesively tackified inner surface is detackified, said detackified inner surface retaining the feel of leather.

4,598,430

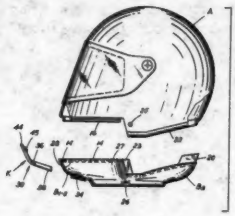
INTEGRAL HELMET, IN PARTICULAR FOR SPORTS USE

Pier L. Nava, Via Carnovali 105, Bergamo, Italy

Filed Sep. 17, 1984, Ser. No. 651,250
Claims priority, application Italy, Oct. 28, 1983, 23536 A/83
Int. Cl.[4] A42B *3/02*
U.S. Cl. 2—410 **16 Claims**

1. An integral helmet especially suited for sports use, provided with an annular unlockable body made of elastically yielding material, said annular body comprising of at least two segments, the first segment (B_3) being secured to the aperture of the body of the helmet (A), the second segment (B_1–B_2) being retained movably as to said first segment by hinges (26), the top edge of said segments (B_1, B_2) being provided with locking elements (14) apt to engage it with the aperture of the

helmet to ensure resistant continuity between the helmet body and said annular body, the adjacent ends of said tiltable segment B_1 and B_2 being externally locked to each other by means of a latch (K).

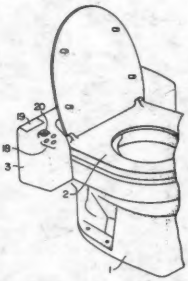


4,598,431

SANITARY CLEANING APPARATUS

Kazutoshi Nagai, Nara; Hirofumi Aoyagi, Habikono; Ichiro Nasu, and Shinichi Watanabe, both of Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 25, 1985, Ser. No. 748,669
Claims priority, application Japan, Jun. 29, 1984, 59-135640
Int. Cl.[4] A47K 4/00
U.S. Cl. 4—420.2 17 Claims



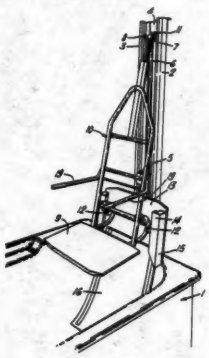
1. A sanitary cleaning apparatus for use by a person sitting on a toilet stool, comprising: electrically operated cleaning means for performing a sanitary function for the person by discharging cleaning water to part of the body of the person; electrically operated additional means for performing an additional sanitary function for said person; means for providing electricity to operate said cleaning means and said additional means; on-off means for turning said cleaning means and said additional means, respectively, on and off; first setting control means for setting the level of the electrical power supplied to at least one of said cleaning means and said additional means; second setting control means for changing the level of the electrical power set by the first setting control means; and human body detector means for detecting the presence or absence of the person on the stool, wherein the electrical power level set by said first setting control means is provided to a respective one of said cleaning means and said additional means by manual operation of said on-off means, the power level set by said first setting control means being variable by manual operation of the second setting control means but being returned to the power level set by said first setting control means in response to a signal provided by said human body detector means.

4,598,432

APPARATUS FOR HELPING A PERSON TO GET IN OR OUT OF A BATH

Cyril M. Pennington-Richards, 1 Tithe Barn Close, Aldwick Bay, Bognor Regis, West Sussex, England

Filed May 21, 1984, Ser. No. 612,261
Claims priority, application United Kingdom, May 27, 1983, 8314760
Int. Cl.[4] A47K 3/12
U.S. Cl. 4—563 10 Claims



1. Apparatus for helping a person to get in or out of a bath, comprising a hydraulic jack mounted firmly in an upright position adjacent the bath and arranged to be vertically extended and/or retracted by a valve controlled supply of fluid under pressure moving a vertically movable member of the jack between raised and lowered positions when the jack is extended and retracted, fixed guide and support means for guiding and laterally supporting the vertically moving member of the jack during extension and retraction, a carrier and a seat mounted at the lower end of the carrier which is connected at its upper end to the vertically movable member of the jack so that the seat is raised and lowered in the bath with raising and lowering of the movable member of the jack, and means pivotally mounting the carrier to the vertically movable member to pivot the carrier and seat about a horizontal axis to allow the lower end of the carrier to move relative to the bath on a pair of wheels through which the carrier contacts and rides over a flexible sheet which covers and protects the inside surface of the bath contacted by the wheels, the sheet being provided with tracks for guiding the wheels to contact and follow the contour of the inside of the bath as the seat is raised out of and lowered into the bath.

4,598,433

SHOWER DOOR STALL ASSEMBLY

Thomas H. Whitney, Attica, Mich., assignor to Trayco, Inc., Lapeer, Mich.

Filed May 18, 1984, Ser. No. 611,585
Int. Cl.[4] A47K 3/22
U.S. Cl. 4—607 12 Claims

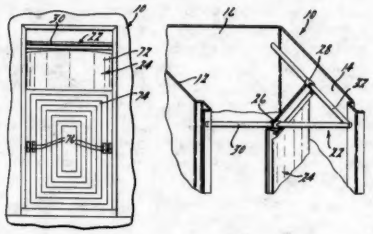
1. A shower door for a shower stall, said door characterized by:

a panel being sufficiently rigid to maintain its shape;

said panel being bowed outwardly to increase the interior space in said shower stall;

said panel being an integrally formed one-piece plastic material;

said panel having at least two bosses forming a handle integral with said panel; and



means for pivotally and slidably moving said panel from an open to a closed position.

4,598,434

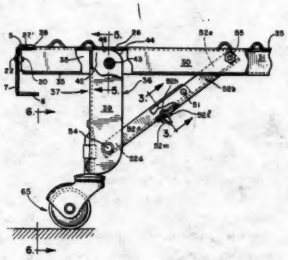
FOLDING LEG SUPPORT FOR METAL BED

Frank J. Mis, 9601 S. Robertson, Oak Lawn, Ill. 60453

Filed May 31, 1984, Ser. No. 615,569

Int. Cl.[4] A47C *19/00*

U.S. Cl. 5—200 R **6 Claims**



1. In a bed structure comprising

a frame having leg-mounting means (**25**),

a leg assembly (**36**),

stabilizing means (**52**) extending between said leg assembly and said leg-mounting means (**25**) for holding said leg assembly in upright position,

means (**54,55**) for securing said stabilizing means to said leg assembly and to said leg-mounting means,

disconnectible means (**52*h***) for holding said stabilizing means in stabilizing position and upon disconnection accommodating movement thereof with the leg assembly to a folded position into said leg-mounting means,

and a securing bolt (**61**) threadable into said leg mounting means for releasably securing said leg assembly and stabilizing means in folded position to said leg-mounting (**25**) means within the same.

4,598,435

OPENER AND STOPPER FOR CRIMPED AND THREADED BOTTLE CAPS

German Borodulin, 2518 Clement St. #4, San Francisco, Calif. 94121; Alexander Shkolnik, 2031 Commonwealth Ave. #10, Brighton, Mass. 02135, and Maxim Persidsky, 35 Temescal Ter., San Francisco, Calif. 94118

Filed Jul. 22, 1985, Ser. No. 757,456

Int. Cl.[4] B67B *7/44*

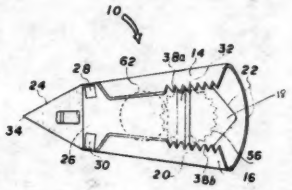
U.S. Cl. 7—156 **9 Claims**

1. A combined bottle opener and stopper for bottle necks of either the type which have a rim for mating with a crimp-on cap or which have male threads with a predetermined pitch for threaded mating with a cap having female threads, comprising:

a plate having upper and lower major surfaces,

said plate having converging sides which extend down from said plate for grasping the outer periphery of a bottle cap and also for engaging a rim on a neck of said bottle,

resilient means between said sides on the lower major surface of said plate for hermetically closing the opening of said bottle after said cap is removed,



said converging sides having edges which are located at different distances from said lower major surface of said plate, the difference in distances of said edges from said lower major surface corresponding to said predetermined pitch of said male threads on said bottle neck, said sides and edges shaped so as to be able to engage the male threads of a threaded bottle neck so that said opener and stopper can be used to seal the neck of a threaded bottle.

4,598,436

CLEANING EQUIPMENT FOR THE SEALING SURFACES OF A VESSEL

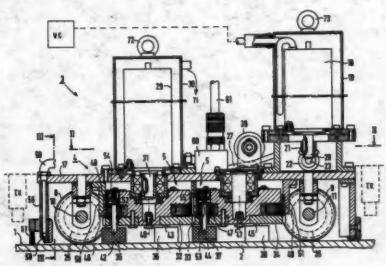
Günther Regnet, Nuremberg; Josef Harrer, Forchheim; Lothar Lüdtke, Erlangen, and Robert Weber, Uttenreuth, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim/Ruhr, Fed. Rep. of Germany

Filed Jun. 22, 1984, Ser. No. 623,482

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1983, 3322454

Int. Cl.[4] A46B *13/02*

U.S. Cl. 15—21 R **16 Claims**



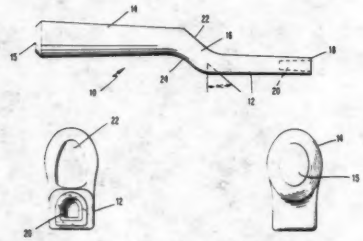
1. Cleaning equipment for sealing surfaces of a vessel having a curvature with a given radius, comprising a carriage for running along a sealing surface, a cleaning unit carried by said carriage, wheels connected to said carriage for moving said carriage on the sealing surface, said wheels describing a curved path having a running radius larger than the given radius of the sealing surface, and two guide posts connected to said carriage for contacting an inner wall surface of the vessel and guiding said carriage on the inner wall surface of the vessel.

4,598,437

MODULAR ORAL HYGIENE SYSTEM

Raymond Ernest, 1612 NE. 105th St., Miami Shores, Fla. 33138, and Stephen J. Ginsburg, 7 Lehigh Rd., Wellesley, Mass. 02181

Filed Aug. 21, 1984, Ser. No. 642,824
Int. Cl.[4] A46B 9/04
U.S. Cl. 15—176 13 Claims



1. An oral hygiene device comprising a detachable head and a handle into which the detachable head can be inserted,

said detachable head comprising a body portion having provided thereon an oral hygiene means and a male extension comprising a main section disposed adjacent to said body portion and an end portion having a reduced cross-sectional area, said end portion having at the tip a projection adapted for retaining said detachable head in said handle;

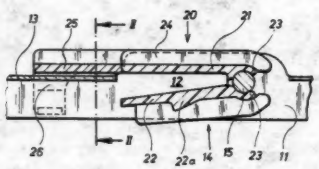
said handle comprising generally parallel front and rear portions connected by a middle portion which forms an angle of about 30 to about 50 degrees with said front and rear portions, the free end of said front portion being provided with a socket to receive the male extension of said detachable head, the upper and lower surfaces of the middle portion being indented to form thumb and finger rests, the front and rear portions having about the same length, said rear section having a generally oval cross-section to fit a user's hand, said handle having a decreasing cross-sectional area from the rear portion to the front portion.

4,598,438

WINDSHIELD WIPER

Bruno Egner-Walter, Heilbronn, and Eckhardt Schmid, Brackenheim, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Sep. 24, 1984, Ser. No. 654,303
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335212
Int. Cl.[4] B60S 1/40
U.S. Cl. 15—250.32 17 Claims



1. A windshield wiper, comprising:

a wiper arm;

an oblong supporting yoke for guiding a wiper rubber, said supporting yoke having at least a substantially U-shaped cross section with two side walls extending in the longitudinal direction of the wiper blade and being connected by a web, said web having an aperture;

a link extending between said side walls in the area of said aperture;

a connecting member connected with the free end of said wiper arm and articulated to said link;

at least one guide body integrally formed with said connecting member and spaced apart from said aperture;

said guide body fittingly resting against at least one side wall of said two side walls of said supporting yoke;

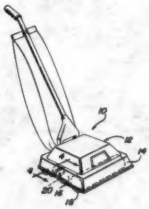
said connecting member having first and second shanks which may be resiliently deflected relative to each other and having a mouth-shaped recess connecting one end of said first and second shanks and open on one side, said recess encompassing said link.

4,598,439

MAGNETIC-VACUUM-CLEANER ATTACHMENT FOR PICKING UP METAL OBJECTS

Jonathan R. Good, 260 E. Palmer, Costa Mesa, Calif. 92627

Filed Dec. 4, 1984, Ser. No. 678,080
Int. Cl.[4] A47L 9/00
U.S. Cl. 15—339 8 Claims



1. A magnetic pick-up attachment for vacuum cleaners, wherein the attachment is adapted to be mounted under the housing of the vacuum cleaner and rearwardly of the vacuum intake, said atachment comprising:

a magnet having a central bore disposed therein;

a first protective plate positioned above the magnet, and having a central hole therein to be aligned with said bore of said magnet;

a second protective plate positioned below said magnet, and including an aligned opening therein; and

a securing bracket attached to said magnet, and adapted to be clamped to said housing; and

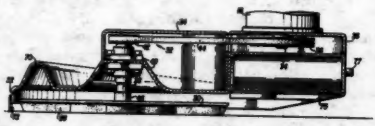
means to secure said bracket to said magnet and its associated cover members.

4,598,440

HIGH SPEED FLOOR BUFFING MACHINE AND FLOOR BUFFING METHOD

William H. Wilson, Sparta, N.C., assignor to Pioneer/Eclipse Corporation, Sparta, N.C.

Filed Jul. 19, 1984, Ser. No. 632,235
Int. Cl.[4] A47L 11/14, 13/16
U.S. Cl. 15—385 25 Claims



1. A buffing machine for buffing waxed floors and the like, comprising:

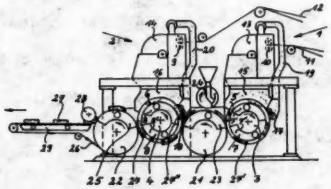
a chassis;
means mounted to the chassis for moving the chassis on a floor;
a motor mounted on said chassis;
a buffing pad holder drivably engaged to said motor; and
an X-shaped buffing pad attached to said buffing pad holder, said buffing pad being formed of loosely spun polymeric fibers.

4,598,441

APPARATUS FOR THE MANUFACTURE OF ABSORPTION PADS FOR ABSORBING BODY FLUID

Kurt Stemmler, Neuwied, Fed. Rep. of Germany, assignor to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG, Neuwied, Fed. Rep. of Germany

Filed Mar. 15, 1985, Ser. No. 712,022
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1984, 3413925
Int. Cl.[4] D01G *13/00*; D04H *1/00*
U.S. Cl. 19—145 **6 Claims**



1. Apparatus for the manufacture of absorption pads for absorbing body fluid, in particular for manufacturing absorption pads for sanitary napkins or the like shaped to fit the human body, said apparatus comprising:
a first flake wheel having shaped recesses for producing a first component layer of the absorption pad;
a second flake wheel having shaped recesses for producing a second component layer of the absorption pad;
a first transfer roll arranged between said first and second flake wheels for lifting off the component layer produced on the first flake wheel and depositing said component layer on the second component layer disposed in the shaped recesses of the second flake wheel; and
a second transfer roll for removing from said second flake wheel the finished absorption pad consisting of said two component layers.

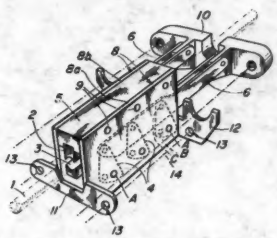
4,598,442

CLAMPING DEVICE FOR CABLES AND ROPE

Otto Luginbühl, Oberthal, Switzerland, assignor to Willy Habegger, Hunibach bei Thun, Switzerland

Filed Mar. 5, 1984, Ser. No. 585,974
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1983, 3307914
Int. Cl.[4] F16G *11/00*
U.S. Cl. 24—132 R **5 Claims**

1. A clamping device for clamping rope, comprising:
a holder;
a fixed clamping jaw for clamping a rope carried by said holder;
a movable clamping jaw arranged in said holder opposite said fixed clamping jaw and defining a gap with said fixed clamping jaw which lies on a path in said holder for a rope;
at least two lever members spaced along said path and pivotally mounted at a first pivotal connection to said holder, each lever member having a second pivotal connection to said movable clamping jaw, and a third pivotal connection;
an actuating arm extending parallel to said path and connected to said third pivotal connection of each lever member, said actuating arm being adjacent said fixed clamping jaw with said first, second and third pivotal connections of said levers each forming a triangle, said actuating arm being displaceable parallel to said path and with respect to said holder for pivoting said movable clamping jaw



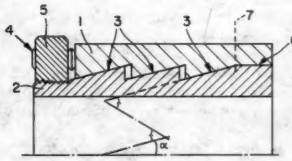
toward and away from said fixed clamping jaw to change said gap; and
an actuator connected between said actuating arm and said holder for displacing said actuating arm with respect to said holder.

4,598,443

DEVICE FOR PROVIDING A CLAMPING JOINT

Sture Östling, Katrineholm, and Bengt Lundgren, Lerum, both of Sweden, assignors to SKF Nova AB, Gothenburg, Sweden

Filed Jan. 23, 1984, Ser. No. 572,877
Claims priority, application Sweden, Mar. 29, 1983, 8301739
Int. Cl.[4] B25G *3/20*; F16B *2/00*
U.S. Cl. 24—136 R **8 Claims**



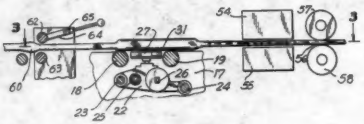
1. A device for producing a friction joint comprising inner and outer sleeve members having cooperating confronting clamping surfaces in the form of helical thread flanks having inclined longitudinal section profiles forming a comparatively small angle (α) to the axis of the thread, means for actuating said sleeve members axially relative to one another effecting radial displacement through said inclined surfaces without rotation of said sleeve members and thereby establishing a clamping joint between said sleeve members, said thread flanks perrmitting rotation of said sleeve members relative to one another and sleeve anti-rotation means operatively associated soley with predetermined thread flanks of said sleeve members to produce a wedging action by interaction between thread flanks only when said sleeve members have been rotated relative to one another to a predetermined end position and thereby prevent further rotation of said sleeve members beyond said predetermined position.

4,598,444

SPREADER-PROPELLER APPARATUS FOR TUBULAR KNITTED FABRIC

Edmund A. Diggle, Jr., Oradell, N.J., assignor to Samcoe Holding Corporation, Woodside, N.Y.

Filed Sep. 19, 1984, Ser. No. 652,321
Int. Cl.[4] D06C 5/00
U.S. Cl. 26—84 10 Claims



1. A magnetically driven spreader apparatus for processing tubular knitted fabrics, which comprises

(a) spreader frame assembly including a pair of laterally spaced spreader frame elements,

(b) means for maintaining said spreader frame elements in a predetermined spaced relation for distending the tubular knitted fabric to a predetermined uniform width,

(c) each of said spreader frame elements having at least one longitudinally extending propeller belt for driving engagement with internal edges of said tubular knitted fabric,

(d) magnetic internal drive sheave means carried by said spreader frame assembly for driving at least certain of said propeller belts,

(e) said spreader frame assembly defining a wide, flat generally two-sided planar structure for maintaining said fabric in flat, two layer form,

(f) a spreader frame support structure,

(g) rotatable magnetic drive means mounted in said support structure and magnetically coupled with said internal drive sheave means,

(h) adjustable support means for said magnetic drive means for effecting inward and outward lateral width adjustment thereof relative to said spreader frame support structure,

(i) movable support means mounted in said support structure, defining a support plane for said spreader frame apparatus and supporting said spreader frame apparatus on a flat side thereof,

(j) said magnetic drive means being mounted on the same side of said spreader frame elements as said movable support means,

(k) means for synchronously driving said movable support means and said magnetic drive means,

(l) said spreader frame assembly and said spreader frame support structure being cooperatively effective to maintain the edge extremities of a fabric, moving over said spreader frame assembly, free of significant external pressure.

7. A magnetically driven spreader apparatus for processing tubular knitted fabrics, which comprises

(a) a pair of laterally spaced spreader frame elements,

(b) means for maintaining said spreader frame elements in a predetermined spaced relation for distending the tubular knitted fabric to a predetermined uniform width,

(c) each of said spreader frame elements having at least one longitudinally extending propeller belt for driving engagement with internal edges of said tubular knitted fabric,

(d) an internal drive sheave carried by each spreader frame element for driving a propeller belt,

(e) said spreader frame elements defining a wide, flat generally planar structure for maintaining said fabric in flat, two layer form,

(f) a spreader frame support structure,

(g) rotatable magnetic drive elements mounted in said support structure and magnetically coupled with said internal drive sheaves,

(h) adjustable support means for said magnetic drive elements for effecting inward and outward lateral width adjustment thereof relative to said spreader frame support structure,

(i) a pair of spaced parallel transversely extending support rollers mounted in said support structure and defining a support plane for said spreader frame,

(j) said magnetic drive elements being mounted between said support rollers and on the same side of said spreader frame elements as said support rollers,

(k) means for synchronously driving said support rollers and said magnetic drive elements,

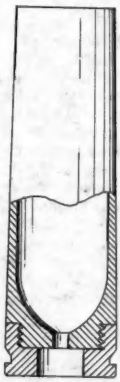
(l) said spreader frame assembly and said spreader frame support structure being cooperatively effective to maintain the edge extremities of a fabric, moving over said spreader frame assembly, free of significant external pressure.

4,598,445

TWO COMPONENT CARTRIDGE CASE AND METHOD OF ASSEMBLY

Donald E. O'Connor, Edisto Island, S.C., assignor to Johnel M. O'Connor, Edisto Island, S.C.

Filed Jan. 2, 1985, Ser. No. 688,311
Int. Cl.[4] B21D 51/54
U.S. Cl. 29—1.3 3 Claims



1. A method of forming a two component cartridge case which comprises the steps of:

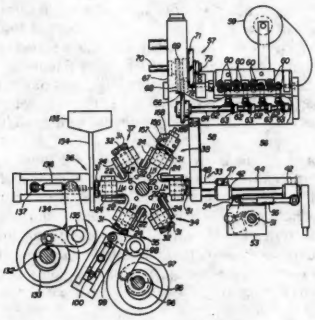
forming a tubular casing body with a mouth portion at the forward end thereof for receiving a selected projectile in gas-sealing mechanically secured relation therein, and with an open-ended breech portion in the form of a cylinder of a smaller diameter than the forward end and threaded with male threads leaving a shoulder at the juncture of the tubular casing body with the smaller diameter threaded cylinder, said threaded cylinder to have a length from said shoulder to the rear or breech end of said tubular casing body between 35% and 65% of the height of the base component and a diameter greater than 70% of the diameter of the base component, with said base component formed of a harder and stronger material than the tubular casing component, with female threads at the forward end thereof of a depth and diameter corresponding to the male threads of the tubular casing component and the outside diameter of the base component at its forward end greater than the length of the base component from its forward end to its breech end.

4,598,446

MACHINE FOR STAKING CAN LEADS

John Rabotski, Sheboygan, Wis., assignor to Summit Corporation of America, Thomaston, Conn.

Filed Sep. 26, 1984, Ser. No. 654,416
Int. Cl.[4] B23Q 7/02
U.S. Cl. 29—34 R 19 Claims



1. An apparatus for attaching wire leads to cans for housing electrical components, comprising:

holding means mounted for rotation about an axis for receiving and holding a wire lead, said holding means includes a spindle having a hub fixedly mounted to a rotatable shaft and at least one spoke projecting radially outwardly from said hub, and a split die having a pair of opposing clamp plates mounted at the outer end of said spoke;

indexing means for rotatably indexing said holding means to a plurality of work stations;

first punch means at a first of said work stations movable between a first position spaced from an end of a wire lead and a second wire upsetting position;

means for reciprocating said first punch means between its positions to upset and head a wire lead at a location spaced from its end;

second punch means at a second of said work stations movable between a first position spaced from the headed end of a wire lead and a second can staking position;

means for reciprocating said second punch means between its positions to feed a can having a bottom hole over the headed end of a wire lead as far as the head and to stake the end of a wire lead to attach said lead to said can; and

release means for releasing said holding means to discharge said can and attached wire lead at a third of said work stations.

4,598,447

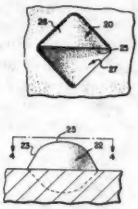
FARRIER'S FILE/RASP

George J. Whyde, Xenia, Ohio, assignor to File Sharpening Company, Xenia, Ohio

Continuation-in-part of Ser. No. 652,786, Sep. 20, 1984, abandoned. This application Aug. 19, 1985, Ser. No. 767,393
Int. Cl.[4] B23D 71/00
U.S. Cl. 29—78 5 Claims

1. A tool having a rasp surface with a plurality of closely spaced upstanding rasp teeth arranged in a plurality of rows, characterized by

each of said rasp teeth having an overall shape which corresponds to a pyramid with a lower corner removed and having a cutting face at the removed lower corner which has a positive face angle and which is defined by upwardly converging side edges surmounted by a sharpened tip of



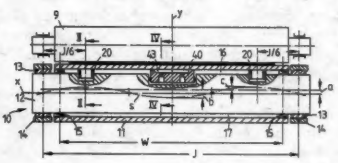
generally arcuate configuration having a radius of curvature at least equal to the depth of the tooth.

4,598,448

PRESS ROLLER WITH ADJUSTABLE BOWING MEANS

Christian Schiel, and Georg Zurn, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Feb. 24, 1984, Ser. No. 583,246
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1983, 3306838
Int. Cl.[4] B21B 13/02
U.S. Cl. 29—116 AD 16 Claims



1. A press roller of the type which co-acts with a counter roller and permits adjustable bowing under load, said press roller including:

a bowing support which extends through a hollow, rotatable roller casing and which rests on cross head bearings in at least one support mounting; and

at least one fluid chamber provided in a fluid filled annular chamber situated between the bowing support and the roller casing, said fluid chamber being divided from the annular chamber by a piston which rests against the roller casing and is movable relative to the bowing support, wherein the bowing support is free from any pipelines connecting the fluid chamber to the area outside the press roller so that a substantially isolated fluid cushion is situated in the fluid chamber.

4,598,449

BEAM FOR A CONTAINMENT STRUCTURE

Richard J. Monhardt, Glastonbury; Alfred B. Orr, West Suffield, and Joseph B. Wright, Somers, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

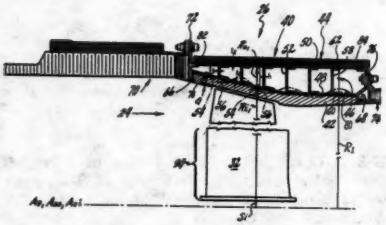
Division of Ser. No. 332,694, Dec. 21, 1981, Pat. No. 4,500,252. This application Dec. 3, 1984, Ser. No. 678,842
Int. Cl.[4] B21D 53/00; F01D 5/10
U.S. Cl. 29—157 R 5 Claims

5. A method of manufacturing a casing for a gas turbine engine which engine casing includes a structure for positioning and supporting a fabric radially outwardly of a working medium flow path in a gas turbine engine to contain particles having a radial velocity, and includes a fabric disposed about the structure, the method including:

disposing a first wall axially and radially with respect to a second wall such that the second wall is axially aligned with the first wall and is spaced radially from the first wall leaving a gap therebetween;

inserting at least one annular plate into the gap between the first wall and the second wall to locate the first wall with respect to the second wall by attaching each of the walls to one of said annular plates and axially spacing each annular plate from any adjacent annular plates;

joining each of the annular plates to the inner wall and the outer wall; and, disposing a fabric about the structure;



wherein each annular plate has a rib extending in a generally radial direction and an inner leg and an outer leg extending from the rib in a generally axial direction, wherein the step of locating the first wall with respect to the second wall includes the step of orienting the annular plate such that the legs face in a first generally axial direction, wherein the step of inserting at least one annular plate includes the step of orienting each additional annular plate such that the legs face in the first direction, and wherein the step of joining the annular plate to the first wall and the second wall is performed immediately after the step of inserting each annular plate and includes joining the outer leg to the first wall and the inner leg to the second wall.

4,598,450

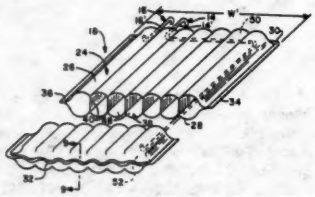
METHOD FOR FABRICATING A SOLAR ENERGY COLLECTOR ASSEMBLY UTILIZING A SPECIFICALLY DESIGNED FLUID STORAGE ARRANGEMENT

James R. Thompson, Sunnyvale; Errol C. Armstrong, Salinas; Richard T. Wipfler, Menlo Park, and Richard O. Rhodes, San Francisco, all of Calif., assignors to FAFCO, Inc., Menlo Park, Calif.

Division of Ser. No. 490,678, May 2, 1983, abandoned. This application Dec. 27, 1984, Ser. No. 685,911

Int. Cl.[4] B21D *53/04*; B23P *15/26*; F24J *2/04*

U.S. Cl. 29—157.3 V **8 Claims**



1. A method of making a structural arrangement comprising the steps of:

(a) providing top and bottom sheets of material which are able to be bent into different shapes when subjected to predetermined forces but which are sufficiently rigid to retain their bent shape after said forces have been removed;

(b) providing a plurality of elongated baffles, each of which has similar bendability and rigidity characteristics as said housing sides and each of which includes top and bottom edge portions and an intermediate main section extending its entire length;

(c) fixedly interconnecting said sheets and baffles to one another in order to construct a collapsed housing having confronting top and bottom sides which are formed from said sheets and which are fixedly connected together at adjacent circumferential edges to define a sealed collapsed inner compartment, said baffles being fixedly connected along the entire top and bottom edge portions to said top and bottom sides, respectively, with their intermediate main sections placed in longitudinally bent configurations; and

(d) temporarily pressurizing said collapsed inner compartment sufficiently to permanently bend said top and bottom sides near their circumferential edges and said baffles in a way which enlarges said compartment and places the main section of said baffles transverse to an imaginary plane defined by said circumferential edges, whereby said baffles serve as reinforcing ribs for said housing, and also as means for limiting the spacing between the housing's top and bottom sides;

(e) said baffles being initially fixedly connected within said collapsed compartment in parallel relationship to one another, wherein each of said top and bottom sheet being constructed of weldable material which is rectangular in configuration such that the adjacent circumferential edges of said housing are divided into adjacent sections which are parallel to said baffles and adjacent sections which are perpendicular to said baffles, and said housing being constructed, in part, by welding together each of said adjacent edge sections perpendicular to said baffles in a way which forms a welded joint which is sufficiently non-linear in configuration so as to eliminate uncontrolled and non-uniform wrinkling at locations along the non-linear welded joint.

4,598,451

METHOD OF PRODUCING A RACK FROM PIPE MATERIAL AND A RACK THUS PRODUCED

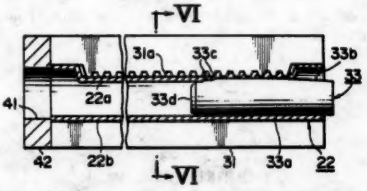
Takanosuke Ohki, Yokohama, Japan, assignor to Kokan Kako Co., Ltd., Yokohama, Japan

Filed Apr. 25, 1984, Ser. No. 603,557

Claims priority, application Japan, May 2, 1983, 58-76278

Int. Cl.[4] B29D *15/00*

U.S. Cl. 29—159.2 **4 Claims**



1. A method of manufacturing a geared rack from a length of cylindrical pipe having substantially the same external diameter as the rack, comprising the steps of:

preforming a flat side wall into the wall of said length of cylindrical pipe for a portion of said length of said pipe;

clamping said preformed length of pipe into a forming die containing a D-shaped internal bore through a portion of its length, said bore having a semicylindrical internal wall with a diameter substantially the same as the external diameter of said length of preformed pipe, and an internal,

planar surface opposing said flat side wall of said preformed length of pipe, which said planar surface contains a female mold comprising the flutes and tooth of a female gear pattern which is complementary to that to be embossed in said flat side wall of said length of preformed pipe; and

inserting a mandrel into one end of said preformed length of pipe and through said length of pipe for a distance equal to said portion of said preformed length of said pipe containing said flat side wall, said mandrel having a cross-sectional area slightly greater than the internal cross-sectional area of said length of preformed pipe, such that said side wall of said length of preformed pipe is forced into contact with said female mold of said gear pattern to emboss said gear pattern into said flat side wall of said length of pipe.

4,598,452

TOOL FOR CONNECTING A PAIR OF PIPES THROUGH A COUPLING PIPE

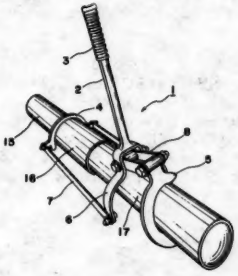
Seiichi Iseki, Kagawa, Japan, assignor to Super Tool Co., Ltd., Osaka, Japan

Filed Jul. 23, 1985, Ser. No. 758,292

Claims priority, application Japan, Jul. 26, 1984, 59-114395[U]

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—237 **2 Claims**



1. A tool for connecting a pair of pipes through a coupling pipe into which one of the pipes is previously bonded at its one end, and the other of the pipes is adapted to insert forcibly from its other end, comprising:

a handle in the shape of a stick having a grip at the top end and at the other end a curved member including a supporting point and a point of application, the supporting point being positioned at the ends of the bending portion of the curved member and the point of application being positioned at the top of the projecting portion of the curved member;

a semicircular plate having an inner diameter slightly larger than the connecting pipe but smaller than the coupling pipe and connected rotatably at its projected side portions with the supporting point of the curved member through a pair of links having a length longer than the coupling pipe;

a crescent-shaped plate having an inner diameter larger than the pipe to be connected and connected rotatably at its neck portion with the point of application of the curved member, and provided with a pair of upper and lower portions which are adapted to engage with the upper and lower portions of the outer surface of the pipe to be connected with offsetting to the axial direction of the pipe;

the pair of portions of the crescent-shaped plate being positioned around the pipe to be connected in parallel to the handle along a line right to the axial direction of the pipes, while the semicircular plate is adapted to locate onto the connecting pipe so as to be attached to the edge of the coupling pipe.

4,598,453

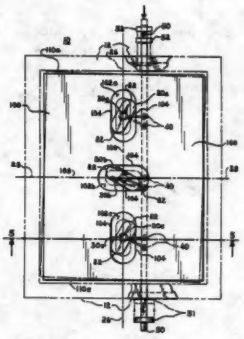
APPARATUS FOR CENTERING AND ALIGNING A WORKPIECE

Thomas M. Wills, Hershey, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 21, 1984, Ser. No. 685,010

Int. Cl.[4] B25B *27/14*

U.S. Cl. 29—271 **8 Claims**



1. Apparatus for centering and aligning a planar workpiece having three laterally spaced elongated apertures, the axes of elongation of a first and second of the apertures being parallel to a first workpiece axis, and the axis of elongation of the third aperture being substantially perpendicular to the first workpiece axis, the apparatus comprising:

planar surface for supporting the workpiece;

first, second, and third elongated cam members mounted adjacent the workpiece supporting surface, each cam member being adapted to be received within a respective one of the apertures and having width and length respectively less than the width and length of the associated aperture, the length of each cam member being greater than the width of the associated aperture; and

means for rotating each of the cam members about an associated axis which is perpendicular to the workpiece supporting surface from an initial position in which the axis of elongation of the cam member is substantially parallel to the axis of elongation of the associated aperture to a final position in which each end of the cam member is in contact with a respective one of the sides of the associated aperture, said axes of rotation of the first, second and third cam members intersecting a common axis in the plane of the workpiece supporting surface, said first and second cam members being located on respective opposite sides of the third cam member along said intersecting common axis.

4,598,454

APPARATUS FOR MANUFACTURING SLIDE FASTENERS WITH FLIES

Akio Yunoki, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Oct. 5, 1984, Ser. No. 658,163

Claims priority, application Japan, Oct. 7, 1983, 58-188753

Int. Cl.[4] B23P *19/04*; B21D *53/54*

U.S. Cl. 29—33.2 **12 Claims**

1. An apparatus for automatically manufacturing a succession of slide fasteners with flies from a continuous slide fastener chain having a pair of intermeshed rows of coupling elements

with element-free spaces therein and stringer tapes supporting the rows of coupling elements, respectively, with the flies sewn to one of the tapes, comprising:

(a) means defining a feed path along which the chain can be fed;

(b) first means in said feed path for folding one of the flies on itself at a time;

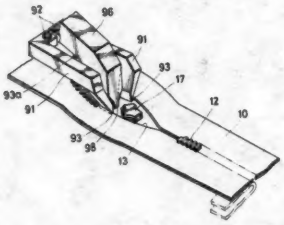
(c) second means in said feed path for mounting one of the sliders at a time on the rows of coupling elements, said second means comprising:

(1) a chain splitter for spreading the element-free space and splitting a leading end of the rows of coupling elements, and

(2) a slider supply unit angularly movable between a first position in which it receives a slider and a second position for placing the slider in the spread element-free space;

(d) said chain splitter comprising:

(1) an angularly movable arm,



(2) a pair of laterally spreadable levers having a pair of fingers, respectively,

(3) a spring acting on said arm for normally urging said fingers to contact said rows of coupling elements, and

(4) a pivotable lever having a wedge movable between said fingers to spread the fingers when said fingers project into the element-free space;

(e) a feed roller assembly for feeding the chain along said feed path in selective engagement with the intermeshed rows of coupling elements;

(f) third means in said feed path for applying a bottom stop to the rows of coupling elements;

(g) fourth means in said feed path for cutting off the chain across one of the element-free spaces to produce a slide fastener with a fly; and

(h) a discharge roller assembly actuatable in synchronism with said feed roller assembly for discharging the assembled slide fastener with the fly.

4,598,455

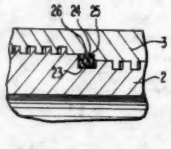
HYDRIL-TYPE CONNECTOR

James B. N. Morris, 22 Colony Rd., Gretna, La. 70053

Division of Ser. No. 871,336, Jan. 23, 1978, Pat. No. 4,496,175, which is a division of Ser. No. 736,492, Oct. 28, 1976, Pat. No. 4,085,951. This application Aug. 18, 1982, Ser. No. 409,059

Int. Cl.[4] B23P *6/00;* **F16L** *55/10, 55/18*

U.S. Cl. 29—402.02 **19 Claims**



1. A method of repairing a damaged joint for interconnecting a pair of oil well pipes, said joint comprising coaxial male and female members respectively including interengageable external and internal first threads, and interengageable external and internal second threads, said first threads on said male member being adjacent the free terminal forward end of said male member and being of smaller outer diameter than said second threads, said threads when interengaged capable of holding said pipes against separation, said first threads and said second threads having substantially the same pitch and outline characteristics, said male member being screwable about said axis longitudinally forwardly into said female member, at least one pair of metal-to-metal seating surfaces on said male and female members, wherein a seating surface is located at or adjacent the free terminal forward end of said female member, said at least one pair of seating surfaces being sealingly interengageable when undamaged, at least one seating surface being damaged so as to no longer be capable of maintaining a pressure differential thereacross, and an annular shoulder area on said male member between said first threads and said second threads, said method comprising forming an annular recess in said shoulder area, said recess being a groove having side walls, an interior surface and an opening, said side walls extending in a generally radial direction from said interior surface to said opening, said groove being enterable from a radial direction of the joint and opening radially outwardly and extending about said shoulder area, and providing in said annular recess an annularly continuous ring of plastic or rubber material, and extending about the periphery of said interior surface, said ring being compressible by and between said pin member and said box member to form a high pressure seal to seal the interior of said pipe from the exterior of said pipe.

4,598,456

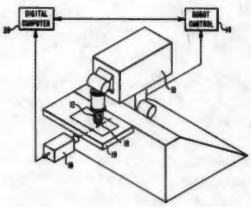
ASSEMBLY SYSTEM FOR ELECTRONIC CIRCUIT BOARDS

William P. McConnell, Columbia, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 19, 1984, Ser. No. 662,647

Int. Cl.[4] B23Q *17/00, 15/00;* **H05K** *3/30;* **B25J** *19/02*

U.S. Cl. 29—407 **8 Claims**



2. A robotic system for assembling electronic circuit boards, comprising in combination:

(a) a multi-axis robotic including a gripper mechanism for holding a component, said component including a plurality of trimmed and preformed leads, each of said plurality of leads adapted for inserting individually into individual openings in said circuit board;

(b) optical sensor means including a TV camera for sensing said plurality of trimmed and preformed lead and for determining the position of each of said plurality of leads relative to said robot;

(c) support means for supporting said circuit board in a fixed position relative to said robot;

(d) control means for selectively positioning said gripper mechanism relative to said circuit board to insert said plurality of trimmed and preformed lead into an opening in said circuit board.

6. A method of individually determining the location of a plurality of leads of an electronic component with respect to a

robotically operated gripper, as said component is held by said robotically operated gripper, comprising the steps of:

(a) operating a robot to position said component within the view of an optical sensor means;

(b) operating said robot to rotate said component about a fixed axis and operating said optical sensor means to produce at least three images of the leads of said component; and

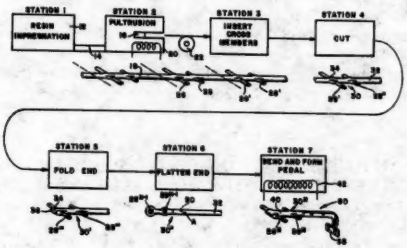
(c) using said at least three images of said leads, calculate the displacement of said leads from a predetermined reference point.

4,598,457

METHOD OF CONSTRUCTING A BRAKE PEDAL

Robert S. Kiwak, Ellicott City, Md., and Tung Liu, Granger, Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Aug. 26, 1985, Ser. No. 769,219
Int. Cl.[4] B23P *17/00*
U.S. Cl. 29—411 4 Claims



1. A method for constructing a brake pedal having one end adapted for pivotal anchoring and the other end substantially defining a pedal cooperating with a foot during a brake application, said method comprising:

(a) generating a continuous tubular member of thermoplastic material;

(b) attaching a plurality of cross members to said continuous tubular member by impacting said plurality of cross members against said continuous tubular member to extend therethrough;

(c) cutting said continuous tubular member into segments containing an equal number of cross members;

(d) deforming one end of each segment to substantially define the pedal; and

(e) folding the other end of each segment to substantially encircle one of said cross members.

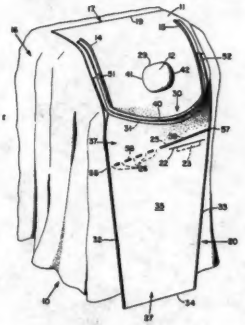
4. A method of constructing a brake pedal having one end adapted for pivotal anchoring relative to a vehicle frame and another end defining a pedal cooperating with a foot of a vehicle operator, said method comprising, generating a continuous member of thermoplastic material by pultruding fiber strands through a resin solution, attaching a plurality of cross members to said continuous member by impacting said plurality of cross members against said continuous member to extend completely therethrough, cutting said continuous member into segments containing an equal number of cross members, said equal number of cross members being disposed remote from one end of said segment, deforming said one end of each segment to substantially define said pedal, and folding the other end of each segment to substantially encircle one of said cross members.

4,598,458

SURGICAL DRAPE WITH FLUID COLLECTION BAG

Spears L. McAllester, Fairfield, Ohio, assignor to The Kendall Company, Boston, Mass.

Filed Apr. 27, 1983, Ser. No. 488,918
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—132 D 9 Claims



1. A surgical drape comprising:

(a) A base sheet constructed of a nonwoven fabric laminate having an upper surface and a lower surface;

(b) A surgical site centrally located across the width of said upper surface of said base sheet through which a surgical procedure is performed;

(c) A fluid collection bag constructed of a flexible, fluid impervious sheet material comprising a front panel having a top edge, a left side, a right side, and a bottom edge; a back panel having a top edge, a left side, a right side, and a bottom edge; said left and right sides, and said bottom edges being closed; said top edge of said back panel being secured to said upper surface of said base sheet; a first opening formed by the open top edges of said front and back panels, said first opening being in fluid communication with said surgical site; a lower chamber located below and in fluid communication with said first opening; and a second opening in said front panel located above said lower chamber so as to prevent fluid discharge by gravity through said second opening and to enable the insertion of fluid discharge means and the measurement and sampling of fluid,

(d) Fluid control rails attached to said upper surface of said base sheet, said rails being located alongside but spaced from said surgical site such that when said base sheet and said bag are in their normal operational position, fluid runoff from said surgical site which flows to and strikes said rails is channeled to said first opening of said bag, said rails being constructed of a flexible, thick-walled tubing encased in a flexible sheet material; and

(e) Means for holding said first opening in an open position when said base sheet and said bag are in their normal operational position, said opening means comprising a flexible, polymeric foam rod encased in a flexible sheet material, a middle section of said encased rod being attached to said top edge of said front panel of said bag, and the ends of said rod being attached to said upper surface of said base sheet.

4,598,459

INSTALLATION FOR MANUAL ASSEMBLYING OF COMPONENTS ON A PRINTED CIRCUIT BOARD

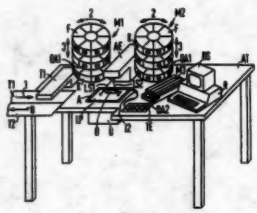
Gerhard Klink, Garching; Dietmar Kraske, Munich; Egon Edinger, Graefelfing; Joachim Koetter, Munich; Klaus Krumrey, Speyer; Jörg Mayser, Bruchsal, and Ulrich Michael, Stockdorf, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 21, 1985, Ser. No. 714,509

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1984, 3410574

Int. Cl.[4] B23P *19/04;* H05K *3/30*

U.S. Cl. 29—564.8 20 Claims



1. In an installation for the manual assembly of components on a printed circuit board comprising a table with holding means for non-mistakable positioning of the printed circuit board on which the components are to be assembled, a display means for optically identifying respective assembly positions of each component on the printed circuit board held by the holding means, at least one magazine for the purpose of making available components required for each assembly operation and arithmetic means for controlling the display means and a removable position for components in each of the magazines corresponding to the specific assembly program, the improvements comprising each magazine being designed for making available all components which are required for a spectrum of PC modules to be produced, the arithmetic means having access to all assembly programs for all of the PC modules of the spectrum of PC modules to be produced and identification means connected to the arithmetic means for identifying a printed circuit board being presented and for activating the associated assembly program for the particular identified printed circuit board.

4,598,460

METHOD OF MAKING A CMOS EPROM WITH INDEPENDENTLY SELECTABLE THRESHOLDS

Alexander H. Owens, Pennington, N.J.; Mark A. Halfacre, Horsham, and David S. Pan, Doylestown, both of Pa., assignors to Solid State Scientific, Inc., Willow Grove, Pa.

Filed Dec. 10, 1984, Ser. No. 680,197

Int. Cl.[4] H01L *21/265;* G11C *11/40;* B01J *17/00*

U.S. Cl. 29—571 10 Claims

1. A method of fabricating on a P-conductivity type substrate an N-channel EPROM FET having self-aligned floating and control gates, a separate N-channel FET device, and a separate P-channel FET device in an N-conductivity type well region formed in said substrate comprising the steps of:

(a) masking said substrate to cover the substrate regions at which said EPROM FET and N-channel device are to be formed and introducing N-type impurities into said substrate to form an N-well region at a portion thereof at which said P-channel device is to be formed;

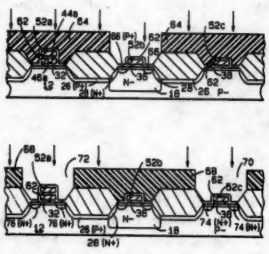
(b) simultaneously introducing P-type impurities into the channel regions of said EPROM FET, said P-channel and said N-channel devices;

(c) selectively forming a first polysilicon layer over the region of the substrate at which said EPROM device is to be formed;

(d) selectively introducing P-type impurities in said channel regions of said P-channel and N-channel devices while said EPROM region is covered by said first polysilicon layer;

(e) forming a second polysilicon layer over the substrate region wherein said EPROM, said P-channel and said N-channel devices are to be formed;

(f) forming on said second polysilicon layer a masking layer just over a central portion of said EPROM region and entirely over said P-channel and N-channel device regions;



(g) removing the portions of said first and second polysilicon layers not covered by said masking layer thereby shaping the EPROM self-aligned floating and control gates;

(h) subsequently etching away portions of said second polysilicon layer to form the gates of the P- and N-channel devices; and

(i) introducing impurities at selected regions of said substrate to form the sources and drains of each of the devices.

4,598,461

METHODS OF MAKING SELF-ALIGNED POWER MOSFET WITH INTEGRAL SOURCE-BASE SHORT

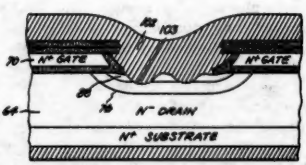
Robert P. Love, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 579,229, Feb. 13, 1984, Pat. No. 4,516,143, which is a continuation of Ser. No. 336,972, Jan. 4, 1982, abandoned. This application Jan. 22, 1985, Ser. No. 693,643

The portion of the term of this patent subsequent to Nov. 29, 2000, has been disclaimed.

Int. Cl.[4] H01L *21/40*

U.S. Cl. 29—571 19 Claims



1. A method of manufacturing a self aligned power MOSFET, said method comprising:

providing a silicon semiconductor wafer substrate including a drain region of one conductivity type having a principal surface;

successively forming on the principal surface a first insulating layer, a conductive gate electrode layer, a second insulating layer, and a third insulating layer;

providing a first mask over said third insulating layer with a window for ultimately defining a base region and source region;

successively etching through a third insulating layer, the second insulating layer, and the conductive gate electrode layer to form openings in areas defined by the windows in

the first mask, with undercutting of the conductive gate layer;
removing the first mask;
introducing into said drain region through the openings defined by the first mask impurities appropriate to form a first region of opposite conductivity type defining a base region of lateral extent determined in part by the size of the openings defined by the first mask;
introducing into said base region also through the openings defined by the first mask impurities appropriate to form a second region of the one conductivity type defining a source region entirely within the base region such that at the principal surface the first region exists as a band of opposite conductivity type between the source region and the drain region;
growing a layer of silcon dioxide on the sidewalls of the opening through the gate electrode layer;
removing with a collimated beam an insulative layer on the surface of the source region in an area defined by the opening in the third insulating layer defined by the first mask without removing the silicon dioxide layer on the sidewalls of the opening through the gate electrode layer;
providing a second mask with windows for defining a gate contact area on a portion of the wafer other than the location of the source region;
successively etching through the third insulating layer and the second insulating layer to form an opening in the window defined by the second mask to the gate electrode layer;
removing the second mask;
coating metal onto the wafer and then patterning the metal by means of a third mask to form source and gate electrode layers; and
heating the wafer to form a microalloy spike extending from the metal source electrode through said second region and partly into said first region to produce an ohmic short between said first and second regions.

4,598,462

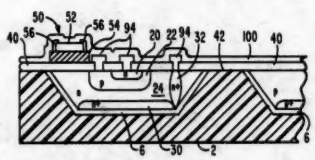
METHOD FOR MAKING SEMICONDUCTOR DEVICE WITH INTEGRAL FUSE

Hosekere S. Chandrasekhar, Whitehouse Station, N.J., assignor to RCA Corporation, Princeton, N.J.

Division of Ser. No. 482,856, Apr. 7, 1983, abandoned. This application Mar. 22, 1985, Ser. No. 715,039

Int. Cl.[4] H01L *21/225*

U.S. Cl. 29—577 C **7 Claims**



1. A method of forming a semiconductor device comprising the steps of:
(a) forming a plurality of spaced apart first conductivity type regions in the surface of a substrate, each of said regions being dielectrically isolated from said substrate;
(b) forming a base of second conductivity type within at least one of said plurality of regions;
(c) forming a layer of silicon oxide on the surface of said at least one region;
(d) forming a layer of silicon nitride on said layer of silicon oxide;
(e) forming a layer of polycrystalline silicon on said layer of nitride;
(f) removing a portion of said layers of nitride and polysilicon to define a fuse element of the remaining portion of said layers;
(g) forming an emitter of first conductivity type within said base formed in step b;
(h) forming a layer of silicon oxide upon said emitter;
(i) forming a plurality of openings in said layer of silicon oxide; thereby exposing portions of said regions;
(j) forming a layer of platinum upon said layer of silicon oxide, said exposed portions of said regions, and said fuse element;
(k) heating said semiconductor and alloying said platinum and said remaining portion of polysilicon of said fuse element and said portions of said regions to form platinum silicide;
(l) removing residual platinum from said semiconductor leaving said platinum silicide fuse element and said platinum silicide portions of said regions;
(m) forming a plurality of electrical contacts, one at each of two extremities of said fuse element and one at each of said portions of said regions;
(n) interconnecting said electrical contacts to form an integrated circuit.

4,598,463

PROCESS FOR PRODUCTION OF COMMUTATOR

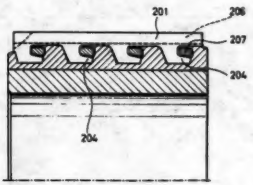
Karl-Heinz Gerlach, Ehningen, and Lothar Wörner, Stuttgart, both of Fed. Rep. of Germany, assignors to Kautt & Bux KG, Fed. Rep. of Germany

Division of Ser. No. 556,095, Nov. 29, 1983, abandoned. This application Oct. 26, 1984, Ser. No. 665,088

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1983, 3245699

Int. Cl.[4] H01R *43/06*

U.S. Cl. 29—597 **15 Claims**



1. A process for the production of a commutator of the arch-thrust type having a segment set, comprising the steps of temporarily reducing the diameter of the segment set, at least to the extent that, subsequently, an armoring ring can be made to slide into an interior annular slot which is formed by the punching of the segments, said punching forming a polygonal seat on said interior annular slot and a portion of said interior annular slot open to the central axis of the segment set; and inserting the armoring ring so as to rest on the polygonal seat on the interior annular slot existing in the segment set which ring receives a radial tension.

4,598,464

PROCESS FOR THE MANUFACTURE OF COLLECTORS OF DIRECT CURRENT ELECTRIC MACHINES

Jean Dewinck, Ransart, and Lucien Hancart, Mont-sur-Marchienne, both of Belgium, assignors to Ateliers de Constructions Electriques de Charlerol, Brussels, Belgium

Filed Jan. 24, 1984, Ser. No. 573,393

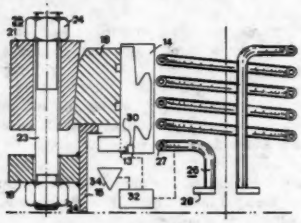
Claims priority, application European Pat. Off., Jan. 24, 1983, 83200097

Int. Cl.[4] C21D *1/04, 1/10*; H01R *43/00*

U.S. Cl. 29—597 **6 Claims**

1. A process for the manufacture and artificial aging of a collector in the form of a collector ring, comprising the steps of:

positioning a collector ring comprising at least one collector sheet and at least one micaceous insulating plate in a stressing apparatus; and



heating said ring by means of an inductor coaxial with said ring, wherein said stressing apparatus radially stresses said collector ring at predetermined values during heating.

4,598,465

METHOD FOR FABRICATING COUPLED CAVITY TRAVELLING WAVE TUBES

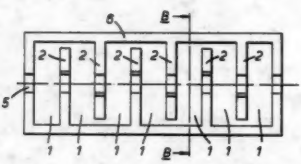
Brian F. Cooper, Chelmsford, and David H. Cottey, East Hanningfield, both of England, assignors to English Electric Valve Company, Chelmsford, England

Filed Oct. 5, 1983, Ser. No. 539,146

Claims priority, application United Kingdom, Oct. 6, 1982, 8228613

Int. Cl.[4] H01P *11/00*

U.S. Cl. 29—600 **17 Claims**



1. A method of constructing a coupled cavity travelling wave tube having a slow wave structure with a plurality of walls that are spaced apart to provide a plurality of cavities in a row, each wall having a centrally disposed beam opening that is aligned with the other beam openings so that the centers of the beam openings are disposed along a line, comprising:

forming a plurality of individual sections for said slow wave structure, each section having an axis that is parallel to said line and being made at least in part by hobbing at right angles to said axis, wherein said individual sections have axial lengths equal to the axial length of a slow wave structure, parts of all of the cavities in said structure being included in each section and being formed at one time by hobbing; and

uniting said sections.

4,598,466

FEEDTHROUGH

Alvaro Arenas, Miami; Thomas O. Bales, Coral Gables, and John W. Box, Miami, all of Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Nov. 16, 1984, Ser. No. 672,339

Int. Cl.[4] H01M *2/06*

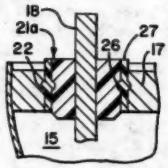
U.S. Cl. 29—623.2 **14 Claims**

1. A method of providing a feedthrough member for securely mounting a conductive wire through a casing wall and for insulating the conductive wire from the casing, comprising:

providing a casing having a wall with an opening therethrough;

positioning a conductive wire within and generally parallel to the axis of the opening through the casing;

forming in situ at least a portion of a feedthrough member within said opening, said in situ forming procedure including



inserting a polymeric material within and in contact with said casing wall opening and said conductive wire, said in situ forming procedure further including subsequently curing said polymeric material therewithin to form a completed polymeric feedthrough member that has a conductive wire mounted therethrough and adhered thereto and that is adhered to the casing wall opening.

4,598,467

PROTECTIVE INTERLAYER FOR HIGH TEMPERATURE SOLID ELECTROLYTE ELECTROCHEMICAL CELLS

Arnold O. Isenberg, Forest Hills Boro, and Roswell J. Ruka, Churchill Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 657,923, Oct. 5, 1984, Pat. No. 4,547,437. This application Jun. 27, 1985, Ser. No. 749,365

Int. Cl.[4] H01M *8/12*

U.S. Cl. 29—623.5 **4 Claims**

1. A method of making a high temperature, solid electrolyte electrochemical cell comprising the steps:

(1) providing a porous support,

(2) applying a first electrode, which is subject to degradation by hot metal halide vapors, to the support,

(3) applying an electrically conductive, oxygen permeable interlayer material on the first electrode, to protect the first electrode from degradation by hot metal halide vapors,

(4) contacting the interlayer material with hot metal halide vapors, to form a metal oxide solid electrolyte layer over the interlayer material, and

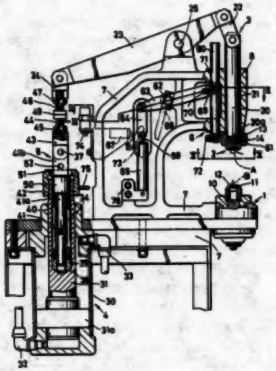
(5) applying a second electrode over the solid electrolyte.

4,598,468

APPARATUS FOR ASSEMBLING A PAIR OF FASTENER ELEMENTS

Kelichi Yoshieda, Kurobe, Japan, assignor to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1984, Ser. No. 673,727
Claims priority, application Japan, Nov. 22, 1983, 58-180593[U]
Int. Cl.[4] B23P *21/00*; B23Q *15/00*; D05B *23/00*
U.S. Cl. 29—716 4 Claims



1. An apparatus for assembling a pair of fastener elements of a garment fastener, comprising:

(a) a frame;

(b) a stationary die supported by said frame for supporting one of the fastener elements;

(c) a vertically movable plunger supported by said frame and carrying a punch in opposite relation to said die for supporting the other fastener element;

(d) first drive means for moving said plunger and thus said punch vertically toward and away from said die to join the two fastener elements together;

(e) a vertically movable supporting rod supported by said frame in parallel relation to said plunger;

(f) a safe-confirmation member mounted on a lower end of said supporting rod;

(g) second drive means for moving said supporting rod vertically between an uppermost position in which said safe-confirmation member is disposed around said punch as retracted from said die, and a lowermost position in which said safe-confirmation member is disposed around said die in the absence of any obstacle near the die, said second drive means including:

(1) a pivot rockably mounted on said frame,

(2) a lever fixed to said pivot and connected at one end to said supporting rod, and

(3) a reciprocating drive operatively connected to the other end of said lever for turning the latter on said pivot through a predetermined angle; and

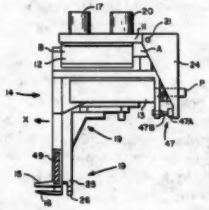
(h) means for detecting when said safe-confirmation member arrives at said lowermost position, said detecting means being operable, in response to said detection to produce a command signal to energize said first drive means.

4,598,469

DOUBLE PINCH-PUSH CONTACT INSERTION END-EFFECTOR

Mark S. Weixel, Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 27, 1984, Ser. No. 675,173
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—747 18 Claims



1. A double pinch-push contact insertion end-effector comprising:

a base plate;

a front jaw assembly having a first pair of jaws;

a rear jaw assembly fixedly mounted to said base plate and having a second pair of jaws;

first means for moving said first jaw assembly relative to said rear jaw assembly, said first means including a ball slide slideably coupled between said front jaw assembly and said base plate and an actuator actively coupled between said front jaw assembly and said base plate;

second means for actuating closure of said first pair of jaws; and

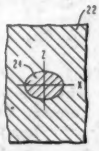
third means for actuating closure of said second pair of jaws.

4,598,470

METHOD FOR PROVIDING IMPROVED ELECTRICAL AND MECHANICAL CONNECTION BETWEEN I/O PIN AND TRANSVERSE VIA SUBSTRATE

William E. Dougherty, Jr., Poughkeepsie, N.Y.; Stuart E. Greer, Shelburne, Vt., and Robert W. Sargent, LaGrangeville, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 506,071, Jun. 20, 1983, abandoned. This application Mar. 18, 1985, Ser. No. 713,569
Int. Cl.[4] H05K *3/30*
U.S. Cl. 29—837 10 Claims



1. A method of forming an aperture in a piece of material comprising the steps of:

providing a material that shrinks in response to a heat treatment by an amount that is different in one orthogonal direction from that in another direction, and which will under said heat treatment irreversibly change dimensions in said orthogonal directions in proportion to said difference;

forming an aperture which is normal to the plane of said orthogonal directions of said material; and

performing said heat treatment to thereby change the shape of said aperture.

6. A method of forming an aperture and securing a conductive pin in said aperture comprising:

forming a unitized dielectric body from a plurality of dielectric planar layers, said body having two major opposite surfaces orthogonal to the direction of said dielectric planar layers, said body shrinking in response to a heat treatment by an amount that is different along the direction of said dielectric planar layers from that in the orthogonal direction to said planar layers, such that each of said major surfaces shrink by differing amounts along two orthogonal axes;

forming an aperture in said substrate through at least one of said major surfaces;

performing said heat treatment to thereby change irreversibly the shape of said aperture through said different amounts of shrinkage along said two orthogonal axes; and

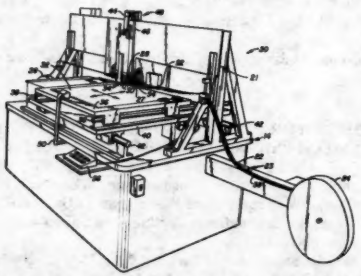
inserting a deformable contact pin into said aperture with one end tightly locked in said aperture and the opposite end protruding therefrom.

4,598,471

PIN INSERTER FOR ELECTRONIC BOARDS

Charles N. Elsbree, Jr., Cupertino, Calif., and Werner Kuhne, Pagosa Springs, Colo., assignors to Symtron Corporation, Mountain View, Calif.

Filed Jan. 22, 1985, Ser. No. 693,697
Int. Cl.[4] H01R *9/14*; B23P *23/00*
U.S. Cl. 29—845 **16 Claims**



1. A method for inserting pins into holes in a circuit board, said pins being joined at one end by a narrow breaking point portion to a carrier strip to form a continuous webbing and having a lower portion for insertion to a circuit board, and a medial portion for protrusion above said circuit board, said method comprising the steps of:

(a) providing a breaker bar with a channel for receiving said carrier strip;

(b) conveying said webbing past a position above and proximate said holes in said circuit board with said carrier strip in said channel of said breaker bar;

(c) providing a pair of confronting jaws for grasping a plurality of pins once confronted, said jaws disposing lower end of said pins for insertion to said board, said jaws grasping said pins at a medial portion thereof and said jaws defining an opening above said confronted jaws for said carrier strip within said channel of said breaker bar;

(d) confronting said jaws to grasp a group of said pins and holding said pins motionless;

(e) rotating said breaker bar with said carrier strip in said channel relative to said confronted jaws and pins to bend and break said webbing at said breaking points thereby separating said grasped pins from said carrier strip;

(f) inserting said grasped pins into said holes in said circuit board; and

(g) repeating steps (a)–(e) for a next group of pins.

3. An apparatus for inserting a row of pins into a row of holes in a table supported circuit board, said pins being joined at an upper end to a carrier strip to form a continuous webbing from said carrier strip and pins, said pins each having a lower portion for insertion to said circuit board and a medial portion for protrusion above said circuit board when inserted therein, said apparatus for inserting comprising:

a pair of jaws supported from a frame, said frame supported from said table, over said circuit board, each jaw having confronting surface for grasping said row of pins at said medial portion, said jaws when confronted defining an opening to allow said carrier strip to protrude from said pins into said opening in said jaws with said lower portions of said pins protruding below said jaws for insertion into said circuit board;

at least one of said jaws defining a plurality of indentations, each said defined indentation for receiving one of said pins at said medial portion;

a breaker bar having a defined slit for receiving said carrier strip, said breaker bar supported from said frame and extending through said opening in said jaws;

means for conveying said carrier strip and pins through said opening in said jaws to register at least one of said pins with one of said indentations, said means for conveying operatively associated with said breaker bar;

means for moving said jaws to and from a confronting relation over said pins while said slot in said breaker bar has said carrier strip contained therein, said means for moving said jaws operatively associated with said frame;

means for relatively rotating said breaker bar with respect to said jaws when closed to sever said pins in said jaws from said carrier strip and leave said severed pins in said jaws, said means for relatively rotating said breaker bar supported from said frame; and

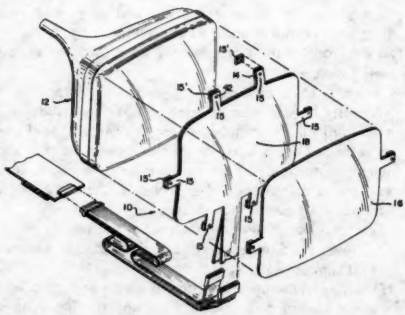
means for moving said jaws towards and away from said circuit board supported from said frame with said pins therein to and toward said holes in said circuit board whereby the lower portion of said pins protruding from said jaws is inserted into said holes in said circuit board.

4,598,472

METHOD FOR FORMING A HEMISPHERICALLY SHAPED SWITCH ASSEMBLY

James R. Schlunz, and Donald G. Stillie, both of Winston-Salem, N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 19, 1983, Ser. No. 524,956
Int. Cl.[4] H05K *3/12*
U.S. Cl. 29—848 **4 Claims**



1. A method for forming flexible film for attaching to generally hemispherical surfaces, the film being of the type used in membrane switches, one side of the film having electrical conductors thereon, the method being characterized by the steps of:

applying conductors to one surface of a flat flexible film, to form a circuit layer,

placing the flexible film circuit layer between two parallel retaining layers of thermoplastic film, the periphery of the circuit layer being freely held between the two retaining layers,

clamping the retaining layers of film between concave and convex surfaces,

transferring heat to at least one surface of the retaining layers until the circuit layer attains a hemispherical shape,

applying a vacuum to the concave surface to hold the circuit layer in its formed condition as the heat is removed and the flexible film circuit layer is allowed to cool.

4,598,473

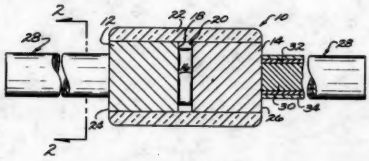
PROCESS FOR PRODUCING REINFORCED STRUCTURAL ARTICLES AND ARTICLES PRODUCED THEREBY

Henry F. Breit, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 299,417, Sep. 4, 1981. This application Jul. 12, 1984, Ser. No. 607,888

Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—855 **7 Claims**



1. A method for minimizing the occurrence of bent leads of an electronic component during manufacture thereof comprising the steps of forming lead material out of composite metal having a first portion of relatively highly electrically conductive and soft material and a second portion of relatively hard and less electrically conductive material, forming the first portion into an elongated circular core, forming the second portion into a layer having a uniform thickness and placing it around the first portion and solid phase bonding the first and second portions while maintaining the second hard portion uniformly concentric relative to the first core portion along its length in order to obviate thermostatic distortion when subjected to elevated processing temperatures, selecting at least one length of said composite metal and electrically and physically attaching an end of the length to the component to serve as a lead, sealing the component by placing electrically insulative sealing material thereon and raising the temperature of the component to an elevated temperature to perfect the seal.

4,598,474

METHOD OF MAKING AN ELECTRICAL PLUG CONNECTION

Gerhard Lutz, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

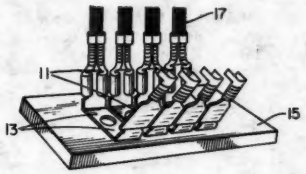
Continuation of Ser. No. 105,218, Dec. 19, 1979, abandoned. This application Jun. 11, 1984, Ser. No. 619,393

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1978, 2856497

Int. Cl.[4] H01R *43/04*

U.S. Cl. 29—863 **4 Claims**

1. A method for the manufacture of a detachable electrical plug connection which is made up of a flat socket and a flat plug comprising connecting the flat plug and flat socket during the forming thereof and prior to the connection of any wire to



either the plug or socket to form a plug unit which can later be detached again.

4,598,475

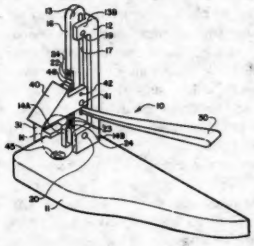
NUTCRACKER WITH AUTOMATIC ADJUSTMENT MEANS

Wesley T. Adams, 3609 Henderson Dr., Greensboro, N.C. 27410

Filed Apr. 5, 1985, Ser. No. 720,442

Int. Cl.[4] A23N *5/00*

U.S. Cl. 30—120.5 **6 Claims**



1. A nut cracker characterized by automatic adjustment to differing sized nuts during the cracking motion, said nutcracker comprising:

(a) a base;

(b) an upright support carried by said base;

(c) a slide bar mounted for limited sliding movement on said upright support;

(d) a nut-cracking head pivotally mounted for sliding movement on said slide bar independent of the sliding movement of said slide bar on said upright support, said head mounted on said slide bar to engage and bear against a nut positioned on said base in engagement relation to said head;

(e) a handle carried by said base in operative relation with said slide bar to move the slide bar back and forth along its direction of travel in response to movement of said handle;

(f) a rack carried by said slide bar;

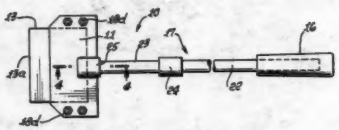
(g) a tooth carried by said nut-cracking head on the pivotally opposite side of said head from the nut engaging portion thereof and positioned to pivot towards and engage said rack at a point thereon dependent on the size of the nut as the handle moves the head into engagement with the nut to arrest the free movement of said head and cause the head to move in unison with said handle as the handle continues to move into nut-cracking position and pivot the head out of rack-engaging position and permit independent movement of said head relative to said slide bar as the handle is moved out of nut-cracking position, whereby the nut itself provides the means for adjusting the nut-cracking head to the proper position to crack successive, differing-sized nuts.

4,598,476

HEAVY DUTY SCRAPER TOOL

Palmer Grasse, 1407 Lee Dr., Glendale, Calif. 91201, assignor to Palmer, Trustee of Grasse Family Trust Grasse, Glendale, Calif.

Filed Feb. 6, 1985, Ser. No. 698,836
Int. Cl.[4] B27G *17/00*
U.S. Cl. 30—169 8 Claims



1. In a heavy duty scraper tool, having a steel blade, the combination comprising

(a) two steel plates extending in parallel relation to clamp said scraper blade therebetween, so that the blade projects forwardly from between the plates to present a forward scraping edge, the blade being rectangular and having forward scraping edge and two laterally spaced forwardly extending edges, the blade having the form of a flat metal sheet,

(b) adjustable fasteners including two pairs of bolts extending through four holes in the plates between and through the plates to clamp them toward and against said blade and so that the fasteners can be loosened to permit blade removal and replacement, the bolts everywhere spaced from the blade, one pair of bolts located proximate one blade lateral edge, and the other pair of bolts located proximate the other blade lateral edge, the two plates having combined thickness substantially greater than the blade thickness,

(c) a connection integral with one plate and forming a pipe thread,

(d) an elongated metal pipe having a thread at one end thereof and threadably joined to said connection to extend rearwardly relative to said plates, said one end of the pipe located proximate said one plate, said pipe extending substantially parallel to the blade,

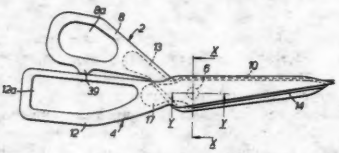
(e) and a handle carried by the pipe, remotely rearwardly from the plates.

4,598,477

CUTTING DEVICE

Nicholas J. Quick, Birmingham, England, assignor to Russell (Shears) Limited, Rawmarsh, England

Filed Sep. 30, 1983, Ser. No. 537,448
Claims priority, application United Kingdom, Oct. 5, 1982, 8228354
Int. Cl.[4] B26B *13/16, 13/06, 13/04*
U.S. Cl. 30—260 8 Claims



1. A cutting device comprising

first and second members each comprising a blade at one end and a handle at the other end,

a pin on which the first and second members are pivotted so that the blades work with a scissor action for cutting purposes, and

a clip which extends longitudinally along an outside face of one of the first and second members,

the cutting device being such that the first and second members are retained on the pin between an abutment part at one end portion of the pin and the clip, the clip slides in a groove at the other end of the pin,

the clip comprises a projection engaged in a complementary recess in one of the first and second members so as to hold the clip in a locking position on the pin,

the clip further comprises a flat strip having at one end a slotted portion and at the other end the projection, the strip being bent back on itself to define a limb parallel with the slotted portion and further bent towards the slotted portion such that the projection extends substantially orthogonally of the slotted portion, and

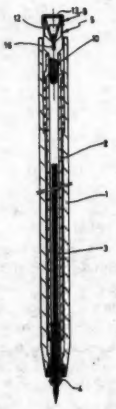
the cutting device being such that the first and second members are separable from each other by sliding the clip in the groove to a release position.

4,598,478

SHARPENER PRESS-BUTTON

Richard D. Buschle, Rod.Presidente Dutra Km 181, Nova Iguaçû, Rio de Janeiro, Brazil

Filed Jun. 27, 1985, Ser. No. 749,364
Claims priority, application Brazil, Jul. 11, 1984, 8403454
Int. Cl.[4] B26B *23/00*
U.S. Cl. 30—457 8 Claims



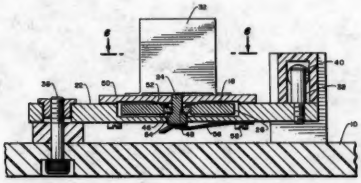
1. Sharpener press-button, comprising a tubular body having one substantially open end and another end closed by a transverse wall, characterized by the fact that the transverse wall is formed on its outer surface with an extension (10) coaxial with the body (6) and cooperative with a propelling pencil for fixing thereto said button, the button (5) further comprising a blade element (12) including a central portion (13) provided with an opening (14), two lateral converging flanks (15) extending from the central portion (13) and the two ends (16) of the flanks remote from the central portion extending parallel and together in the direction away from the central portion (13), the blade element (12) being housed within the tubular body (6), with said ends (16) inserted into a recess (17) in the inner face of the transverse wall and the central portion (13) adjacent the open end (9a) of the body, the lateral flanks (15) being formed with cutouts (18) extending in the axial direction of the button and tapered in the direction away from the central portion (13) of the blade element (12), the button body having at least one radial penetrating aperture (7).

4,598,479

TIMING WHEEL FOR CARD ENCODER

René Baus, Rancho Palos Verdes, Calif., assignor to American Magnetics Corporation, Carson, Calif.

Division of Ser. No. 214,166, Dec. 8, 1980. This application Nov. 1, 1985, Ser. No. 794,174
Int. Cl.[4] G11B *15/18;* G01B *3/12*
U.S. Cl. 33—129 1 Claim



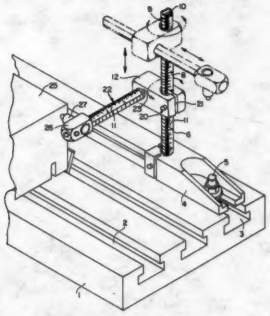
1. Mounting for a spatial measurement wheel comprising:
a wheel having a circumferential periphery adapted to rollably engage a surface to be spatially measured, a central axle hole, and a pair of thrust bearing surfaces circumjacent said hole on opposite sides of said wheel;
housing means for mounting said wheel;
axle means passing through said hole slidably fitted to said housing means for rotatably mounting said wheel to said housing means;
said axle means having a shoulder thereon bearing against one of said thrust bearing surfaces;
said housing means having an annular surface facing and engaging the other of said thrust bearing surfaces;
means for axially biasing said axle toward said annular surface, thereby to inhibit nutation as said wheel is rotated.

4,598,480

MULTI-POSITION STOP-GAUGE

Mirko Cukelj, 11459 Chapin St., Chesterland, Ohio 44026

Filed Nov. 4, 1985, Ser. No. 794,690
Int. Cl.[4] G01B *5/20*
U.S. Cl. 33—169 R 8 Claims



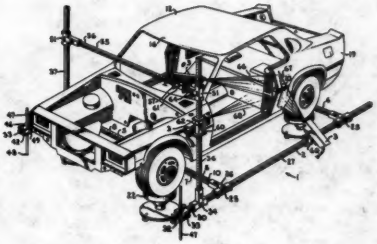
1. A stop gauge comprising a base, a post extending upwardly therefrom, a clamping block mounted on the post and an indicating arm extending from the said block having an indicating head at its extremity, the post being formed with means to interlock with the block in one position and the block having elements to interlock with the post in said position, swinging movement of the block from one position to another effecting disengagement of the means and elements to permit shifting of the block on the post to a different position for interlocking to maintain the block in said different position.

4,598,481

INTERSECTING LASER ALIGNMENT APPARATUS AND METHOD

Robert L. Donahue, McPherson, Kans., assignor to Hein-Werner Corporation, Waukesha, Wis.

Filed Aug. 12, 1985, Ser. No. 764,678
Int. Cl.[4] G01B *5/03, 11/03*
U.S. Cl. 33—288 7 Claims



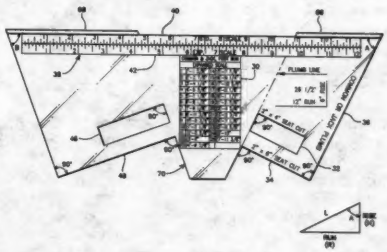
5. An alignment measuring and checking apparatus for vehicle frames and bodies comprising:
(a) a datum plane bar mounted along a side of said vehicle and parallel to the centerline thereof;
(b) a crossbar mounted adjacent an end of said vehicle and perpendicular to the centerline thereof;
(c) said datum plane bar and said crossbar having scale indicia thereon;
(d) a plurality of sighting instruments emitting planes of light and means slidably mounting said sighting instruments to said datum plane bar and said crossbar so that said planes project perpendicularly thereto;
(i) a first sighting instrument mounted on said crossbar, projecting a vertical plane of light, and establishing an X axis; and
(ii) a second sighting instrument mounted on said datum plane bar and projecting a vertical plane of light, thereby establishing a Y axis, and intersecting the plane of light from said first sighting instrument, whereby a point on said vehicle can be expressed in X, Y and Z coordinates and its position determined in said vehicle.

4,598,482

RAFTER CUTTING TEMPLATE AND TAPE

Thomas E. Castleton, P.O. Box 81, Moss Beach, Calif. 94038

Filed Oct. 28, 1985, Ser. No. 792,133
Int. Cl.[4] B43L *7/00*
U.S. Cl. 33—482 13 Claims



1. A rafter cutting template and guide for laying out each type of roof rafter for a selected roof pitch given a zero pitch roof plan with the zero pitch length of all common, jack,

cripple jack, valley jack, verge, hip, both backed and unbacked, and valley rafters, the template comprising:

a body portion having a straight top edge, a first side edge making a first acute included angle with one end of the top edge, a second side edge making a second acute included angle with the other end of the top edge, a first and a second seat cut guide surface each being at a right angle with the end of the first and second side edges, respectively, away from the top edge and extending toward each other, and first and second side edge extensions each being at a right angle with the first and second seat cut guide surfaces, respectively, and extending away from the top edge; and

wing means attached perpendicularly to the body portion along the top edge thereof for abutting the stock from which the desired rafter is to be cut.

4,598,483

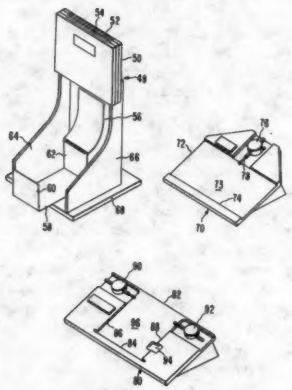
APPARATUS AND METHOD FOR VERIFICATION OF JACKET FOR FLOPPY DISK

Quincy D. Kygar, 19683 Charters Ave., Saratoga, Calif. 95070

Filed Jul. 5, 1985, Ser. No. 752,417

Int. Cl.[4] G01B *5/02*

U.S. Cl. 33—548 **18 Claims**



1. Apparatus for determining the dimensional characteristic of a jacket for a floppy disk in which the jacket has a first fold line, a pair of primary fold lines extending from respective ends of the first fold line, a final fold line on the margin of the jacket opposite to the first fold line, a head cutout slot, and a write-enable notch in one of the primary fold lines comprising:

first means including a generally vertical slot for receiving and passing a jacket along a generally vertical path to determine the warpage of the jacket;

second means adjacent to the first means for determining the parallelism between the primary fold lines of the jacket;

third means adjacent to the first and second means for determining the squareness between the first first fold line and each of the primary fold lines of the jacket;

fourth means adjacent to the first, second and third means for determining the distance from the center line of the jacket to each of the primary fold lines thereof;

fifth means adajcent to the first, second, third and fourth means for determining the distance from the first fold line to the adjacent extremity of the head cutout slot;

sixth means adjacent to the first, second, third, fourth and fifth means for determining the width and depth of the write-enable notch of the jacket and for measuring the distance from the notch to the first fold line of the jacket;

seventh means adjacent to the first, second, third, fourth, fifth and sixth means for determining the squareness of the primary and final fold lines of the jacket relative to the first fold line thereof; and

eighth means adjacent to the first, second, third, fourth, fifth, sixth and seventh means for determining the thickness of the jacket at the regions of the primary fold lines and the final fold line of the jacket.

4,598,484

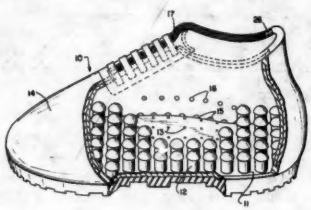
FOOTWEAR

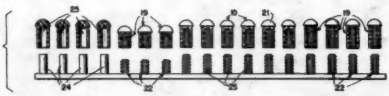
Sung S. Ma, 81-11 45 Ave. 10H, Elmhurst, N.Y. 11373

Filed Aug. 29, 1984, Ser. No. 645,260

Int. Cl.[4] A43B *7/06*

U.S. Cl. 36—3 R **12 Claims**





1. A height-controlling insole for footwear which comprises:

an insole;

a plurality of non-slip profile members connected to said insole; and

means for varying the height of at least a portion of said profile members, said profile members including vertically disposed pins atached to the insole and a cap and head composite member which is in screw engaging relationship with said pins whereby said profiles can be adjusted to conform to the curvature of the bottom of the foot.

4,598,485

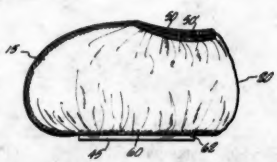
SLIP-RESISTANT DISPOSABLE SHOE COVER

Chun-Chuan Joe, and Fa-Chang Joe, both of 2578 Daytona Ave., Hacienda Hgts., Calif. 91745

Filed Jun. 10, 1985, Ser. No. 743,383

Int. Cl.[4] A43B *3/18*

U.S. Cl. 36—7.2 **14 Claims**



1. A slip-resistant disposable shoe cover comprising:

(a) a foot-shaped body formed of flexible foldable sheet material, the body comprising an inside surface and an outside surface, the outside surface including a bottom having a bottom seam which runs longitudinally along the length of the bottom;

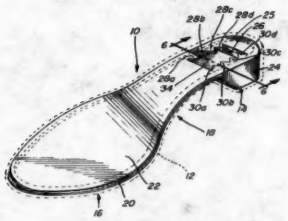
(b) a bottom rib formed of a strip of flexible, stretchable, resilient, and slip-resistant material, the bottom rib having a stretched length and a relaxed length, the relaxed length being shorter than the length of the bottom seam, the bottom rib extending along and through the bottom seam, and being affixed to the bottom seam such that the bottom rib yieldably gathers the material of the bottom along the bottom seam, with the bottom rib being at least partly exposed on the outside of the cover along the bottom seam, and at least partly exposed on the inside of the body along the bottom seam.

4,598,486

PROTECTIVE SOLE ASSEMBLY

Icaro Olivieri, Westmount, Canada, assignor to Warrington Inc., Montreal, Canada

Filed Jan. 15, 1985, Ser. No. 691,741
Claims priority, application Canada, Jan. 19, 1984, 445601
Int. Cl.[4] A43B *7/14*
U.S. Cl. 36—96 **3 Claims**



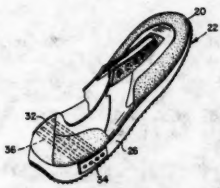
1. A sole assembly including a protective mid-sole and an integrally molded insole and heel plug, the plug portion including a top surface, a recessed bed having side walls in the top surface, spaced-apart saw-tooth projections on the side walls in the recessed bed, a slot extending through the insole laterally thereof adjacent the plug and communicating with the recessed bed, the protective mid-sole including a rearward extension adapted to pass through the slot in the insole and be received in the recessed bed, the rearward extension of the mid-sole including complementary saw-tooth projections adapted to be engaged by the saw-tooth projections on the side walls of the recess to provide both lengthwise and widthwise stability.

4,598,487

ATHLETIC SHOES FOR SPORTS-ORIENTED ACTIVITIES

Kenneth W. Misevich, Fairfield, Conn., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 14, 1984, Ser. No. 589,411
Int. Cl.[4] A43B *13/18, 7/32, 13/00*
U.S. Cl. 36—114 **20 Claims**



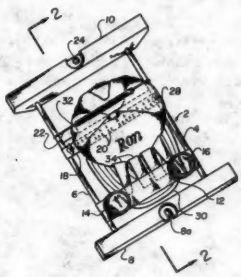
1. In an athletic shoe having a flexible outsole and a foamed, closed cell, polymeric intermediate sole structure overlying said outsole for cushioning the wearer's foot, a pair of opposing spaced apart constraint plates seated against the oppositely facing side borders of said intermediate sole structure, a substantial portion of said intermediate sole structure lying between said plates, and tie means engaging said plates to cause said plates to constrain outward lateral expansion of said portion upon vertical compression thereof by a wearer applied load.

4,598,488

EMBROIDERY FRAME

Ronald N. Inteso, 6311 De Soto Ave., Unit L, Woodland Hills, Calif. 91367

Filed Aug. 26, 1985, Ser. No. 769,439
Int. Cl.[4] D06C *3/08*
U.S. Cl. 38—102.3 **5 Claims**



1. A device for use in conjunction with a machine for embroidering and monogramming hats, which comprises:

a. a frame, said frame being generally rectangular in shape and comprising first and second side members joined at their ends to the corresponding ends of front and back members thereof;

b. a first means to secure the front section of a hat to said frame, said means comprising a clamp, including a top and bottom section, and a plurality of clips each of which has a back end that is placed along and pressed into the front portion of the hat and a front flat end that is inserted under said top section of the clamp to stretch taut the section of said hat to be embroidered or monogrammed; and

c. a second means to secure the back section of a hat to said frame, said second means including a cross member having ends that are lockably connected to said first and second side members, respectively, in slideable relationship therewith, said cross member containing a plurality of generally vertically extending teeth disposed along the upper surface thereof for penetrating the fabric and securing the back section of said hat during the process of embroidering or monogramming.

4,598,489

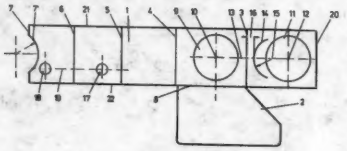
TAG FOR A CONTAINER

Klaus-Peter Hoffman, Ellerbek, Fed. Rep. of Germany, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Sep. 28, 1984, Ser. No. 656,113
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1983, 8328150[U]
Int. Cl.[4] G09F *3/00*
U.S. Cl. 40—310 **5 Claims**

1. A tag made from a foldable, flexible material for a container with a closure, whose external diameter is larger at the lower end than the external diameter of the container region located immediately below the lower end of the closure, with at least one circular opening provided in the tag and whose diameter is slightly larger than the maximum external diameter of the closure, characterized in that adjacent to the opening, an auxiliary opening of the same size is provided, between which

and the opening is provided a folding line at right angles to the connecting line of the centers of the opening and the auxiliary

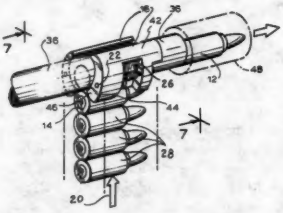


opening and which is further from the auxiliary opening than from the opening.

4,598,490
AMMUNITION MAGAZINE

Giulio V. Savioli, Andover, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 4, 1983, Ser. No. 548,903
Int. Cl.[4] F41C *25/02, 25/08*
U.S. Cl. 42—50 **1 Claim**



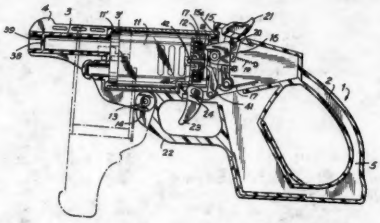
1. In an ammunition magazine for an automatic weapon wherein a spring-loaded column of successive cartridges are each fed in alignment to a firing chamber upon the reciprocating action of a bolt, the improvement comprising:
a pair of feed gates each gate of which is pivotally mounted on said magazine,
said feed gates each having an upper and lower end;
said feed gates having a cam inner surface on said upper ends provided for contact by said bolt of said weapon,
said cam surface upon contact by said bolt pivotally opens said upper ends of said gates for feeding said first cartridge into said chamber of said weapon,
said upper ends of said gates together forming a semicircular, separable engaged, retaining cover for a first cartridge, and
said lower ends of said gate being separable engaged in sequence with a second successive cartridge in response to pivotal movement of said upper ends of said gates.

4,598,491
TOY CAP GUN

Sid Noble, Hong Kong, Hong Kong, assignor to Arco Industries, Ltd., Kowloon, Hong Kong

Filed Mar. 29, 1985, Ser. No. 717,970
Int. Cl.[4] F41C *3/06*
U.S. Cl. 42—58 **7 Claims**

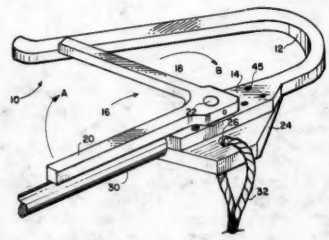
1. A toy cap gun comprising: a chamber illuminating and amplifying cap detonation such that the flash is visible through the material of the chamber wall; a gun barrel located on an outer end of the chamber; a rotating cap anvil means located on an inner end of the chamber and extending into and holding caps within said chamber; a hammer located adjacent to said cap anvil means and intermittently striking and detonating the caps; and trigger means located outside the chamber and mechanically connected to the hammer for intermittently impacting the hammer against the caps.



4,598,492
FISH GAFF

Billy M. Stanfield, Orlando, Fla., assignor to Thomas Gore, Orlando, Fla.

Filed Sep. 30, 1985, Ser. No. 781,270
Int. Cl.[4] A01K *97/14*
U.S. Cl. 43—5 **12 Claims**



1. A gaff for landing game fish and the like comprising:
a crook formed to engage the body of a fish;
an end portion attached to said crook;
an L-shaped element having a contact arm and a capture arm, said L-shaped element having a pivot pin attached to said end portion such that said L-shaped element is rotatable in the plane of said crook; and
ratchet means attached to said end portion and said L-shaped element for permitting said L-shaped element to rotate in one direction such that said crook is first closed by said contact arm and thereafter closed by said capture arm.

4,598,493
RETRIEVING DEVICE FOR SNAGGED FISHING APPARATUS

William O'Brien, 1710 Coventry Rd., Joliet, Ill. 60432, and Kevin Pozulp, R.R. #1, Box #177, Lockport, Ill. 60441

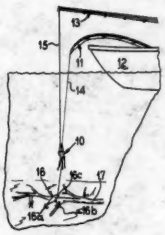
Filed Nov. 2, 1983, Ser. No. 547,843
Int. Cl.[4] A01K *91/00*
U.S. Cl. 43—17.2 **15 Claims**

15. A retrieving device for connection to a retrieving line for retrieving a snagged fishing lure connected to a snagged line, comprising:
a weighted main body having a longitudinal aperture which receives an insert also having an aperture;
both the main body and the insert each having a slit;
the slit being positioned in the insert such that the slit may be aligned with the main body slit so as to permit the snagged

line to be positioned from a location external to the retrieval device to an internal position within the aperture of the insert, and such that when a position of the insert is changed and the slits are no longer aligned, the snagged line will be retained within the insert aperture and the main body will guide itself downwardly along the snagged line;

attachment means for attaching the retrieving line to the main body;

a plurality of chains being suspended from a bottom portion of the main body and being positioned and dimensioned



such that one or more apertures of the chains can engage hooks of the lure when the retrieval device is lowered to a vicinity of the snagged lure; and

the attachment means comprising a spring clip having one end adapted for tying to the retrieving line and the other end having mounting portions freely received in mounting apertures of the main body, the mounting apertures, the clip, and the clip mounting portions being dimensioned and positioned such that with the insert received within the main body, the insert blocks disengagement of the clip mounting portions from said mounting apertures.

4,598,494

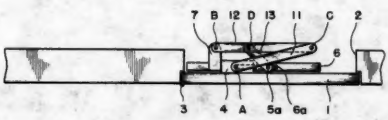
APPARATUS FOR CLOSING FIREPROOF DOORS

Toshihide Tsuji, Sagamihara; Yoshinori Ioka, Yotsukaido; Hisatugu Anzai, Machida; Noboru Kasahara, and Fujio Katagiri, both of Fuchu, all of Japan, assignors to Ryobi Ltd., Fuchu and Hochiki Corporation, Tokyo, both of, Japan

Filed Aug. 6, 1984, Ser. No. 637,857

Int. Cl.[4] E05F *15/20*

U.S. Cl. 49—2 **1 Claim**



1. Apparatus for closing a fireproof door, wherein the fireproof door is hinged to a door frame swingably between its closing and opening positions, which comprises;

a door closer secured to the fireproof door and having a driving shaft;

a release secured to the door frame and provided with a longitudinal slot on the upper surface thereof;

a slider slidably mounted inside the said release and provided with a pin extending outwardly through said slot of the release;

a latch mechanism arranged inside the release to prevent the sliding movement of said slider;

a first link arm, one end of which being pivoted to said driving shaft of said door closer;

a second link arm, one end of which being pivoted to the other end of said first link arm, and the other end of which being pivoted to said release; and

a supplemental link arm, one end of which being pivoted to said pin of the slider, and the other end of which being pivoted to the intermediate point of said second link arm;

wherein the sliding movement of said slider being prevented by said latch mechanism when the fireproof door is fully open so as to maintain the fireproof door in its opening position, while the fireproof door is closed by the closing force of said door closer when the latch mechanism release the slider.

4,598,495

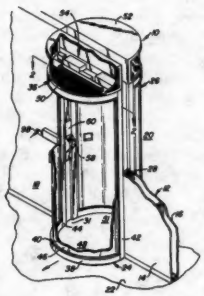
SECURITY ENCLOSURE FOR A DOOR FRAME

Paul Labarile, Pittsburg, Calif., assignor to Campbell Design Group, Inc., Pacheco, Calif.

Filed Aug. 20, 1984, Ser. No. 642,145

Int. Cl.[4] E06B *3/90;* **E05C** *19/10*

U.S. Cl. 49—41 **15 Claims**



1. A security enclosure for a door frame within a wall having first and second sides and spaced adjacent thereto and the wall extending upwardly from a base comprising:

a. a first door having a first portion hingedly connected to the door frame, a second portion capable of being positioned immediately adjacent the wall, and a third portion connected to said first and second portions and lying away from the door frame when said second portion of said first door positions immediately adjacent the door frame, said first, second and third portions of said first door forming a first chamber with the base, said first chamber extending outwardly from the first side of the wall;

b. a second door having a first portion hingedly connected to the door frame, a second portion capable of being positioned immediately adjacent the wall, and a third portion connected to said first and second portions and lying away from the door frame when said second portion of said second door positions immediately adjacent the door frame, said first, second, and third portions of said second door forming a second chamber with the base, said second chamber extending outwardly from the second side of the wall said first and second chambers interconnecting to form a chamber unit; and

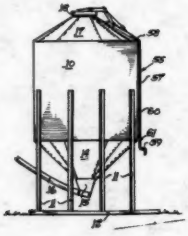
c. means for permitting said second portion of said first door to travel to the space on the second side of the wall a sufficient distance to form a gap between said second portion of said first door and the door frame, said gap permitting movement of persons from the first to the second side of the wall.

4,598,496

STORAGE BIN LID CLOSING MECHANISM

Antoine Van Daele, Milford, Ind., assignor to Brock Manufacturing Company, Milford, Ind.

Filed Aug. 29, 1983, Ser. No. 527,002
Int. Cl.[4] E05F *11/00*
U.S. Cl. 49—357 11 Claims



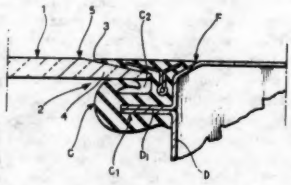
1. A lid moving mechanism for use with a bin having a lid, comprising, in combination, a bi-ended hinge arm pivotable about one arm end, means for attaching the lid to the other hinge arm end, and jack means for moving the hinge arm and attached lid between open and closing positions on the bin, said jack means comprising tube means, a helical spindle fixed within said tube means and turning shaft means adapted to rotatably engage the spindle and move into and out of the tube means and spindle, extension means for rotating the turning shaft means from a remote location and said extension means including universal joint means comprising spring means connected to the turning shaft means, crankshaft means connected to the spring means and rotor means for rotating the crankshaft means, universal joint means and turning shaft means from said remote location.

4,598,497

SLIDING PANE FOR MOTOR VEHICLE WINDOWS

Nevio Di Giusto, Cellegno, and Felice Cornacchia, Turin, both of Italy, assignors to Fiat Auto S.p.A., Turin, Italy

Filed Apr. 2, 1985, Ser. No. 718,988
Claims priority, application Italy, Apr. 2, 1984, 53213/84[U]
Int. Cl.[4] E06B *1/04*
U.S. Cl. 49—374 1 Claim



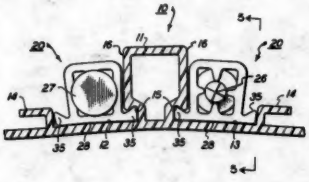
1. A sliding pane for a motor vehicle window having channel-shaped guide bodies fixed to those parts of the motor vehicle body defining the window opening, the pane having edges slidable in the channels of respective said guide bodies in use, wherein the improvements consist in the corners of the edges of the pane intended to face outwardly of the vehicle being chamfered to define outer tapered portions which can be housed slidingly in the channels of the respective guide bodies in use, and the regions of the outer surface of the pane contiguous with the chamfers being substantially co-planar with the outer surface of the parts of the vehicle body defining the window opening adjacent these regions.

4,598,498

JAMB LINER SASH STOP

Garry P. Haltof; Eugene S. Stephens, both of Rochester, and Zygmunt J. Czubachowski, North Chili, all of N.Y., assignors to Caldwell Manufacturing Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 651,522, Sep. 17, 1984, abandoned. This application May 3, 1985, Ser. No. 730,088
Int. Cl.[4] E05D *15/16*
U.S. Cl. 49—407 21 Claims



1. In a sash stop and jamb liner wherein said jamb liner has a parting bead between a pair of sash runs and said sash stop has an extruded body with a longitudinal inside cavity receiving a nail longer than said body, the improvement comprising:

a. opposite sides of said parting bead having retainer slots adjacent said sash run; and

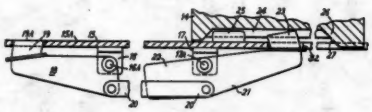
b. opposite longitudinal edges of said sash stop being receivable into said retainer slots for holding said sash stop in a longitudinally movable position adjacent said parting bead where said opposite longitudinal edges engage said sash run.

4,598,499

SLIDING DOOR EDGE SUPPORT

George C. Viner, Chippenham, United Kingdom, assignor to Westinghouse Brake & Signal, Wiltshire, England

Filed Feb. 29, 1984, Ser. No. 584,891
Claims priority, application United Kingdom, Mar. 25, 1983, 8308301
Int. Cl.[4] E05D *13/00*
U.S. Cl. 49—411 5 Claims



1. A sliding door arrangement comprising a sliding door mounted in a doorway for sliding movement between an open and a closed position,

the doorway having a threshold in which is formed an aperture in a position below a free edge of the door when the door is in the closed position thereof,

a retaining member mounted below the threshold and in a position where the retaining member can be raised and lowered through said aperture, the retaining member, when raised, engaging said free edge of the door and, when lowered, lying flush with the threshold,

means for raising and lowering said retaining member, said raising and lowering means comprising a first rocking lever pivotally mounted below the threshold which carries the retaining member, a second rocking lever pivotally mounted in a position to be engaged by and moved by the door as the door reaches the closed position thereof, and a rigid link having first and second ends, wherein said first end of said rigid link is pivotally connected to the first rocking lever and said second end of said rigid link is pivotally connected to the second rocking

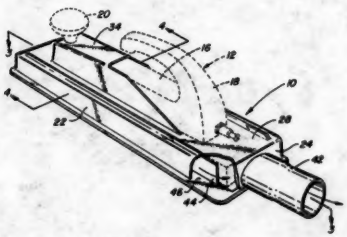
lever, whereby, as the door reaches the closed position thereof, the door engages and moves the second lever and the resultant movement of said second lever is transmitted through the rigid link to the first lever which raises the retaining member into engagement with the free edge of the door thereby retaining the free end of the door in place.

4,598,500

DUST COLLECTOR FOR AIR SANDER

Julio P. Faraudo, 3498 Mendocino Ave., and Frank A. Faraudo, 1228 Janero Dr., both of Santa Rosa, Calif. 95401

Filed Jul. 31, 1985, Ser. No. 761,741
Int. Cl.[4] B24B *55/06*
U.S. Cl. 51—273 **6 Claims**



1. A cover device for a generally elongated power sander having a body with forward and rearward handle means and an oscillating platen, said device being adapted to confine and remove dust and debris particles from the sander during its operation, and comprising:

a main body having a transverse member with sidewalls and end walls forming a barrier means that surrounds the sander platen and having openings to accommodate said handle means;

a pair of internal wall means forming elongated air passages within said barrier means and adjacent the sides of said sander platen, said elongated air passages being open at their opposite ends to spaces between the inside of said barrier means and the ends of said sander platen to facilitate the flow of air and entrained particles from said sander; and

outlet means at one end of said barrier means adapted for connection with a conduit attached to an air vacuum source.

4,598,501

CRYOGEN SHOT BLAST DEFLASHING SYSTEM WITH BELLOWS RETURN CONDUIT

Gilbert J. Vasek, Strongsville, Ohio, assignor to AGA AB, Cleveland, Ohio

Filed Oct. 28, 1983, Ser. No. 546,430
Int. Cl.[4] B24C *3/04*
U.S. Cl. 51—425 **14 Claims**

1. A cryogen shot blast deflashing apparatus, comprising:

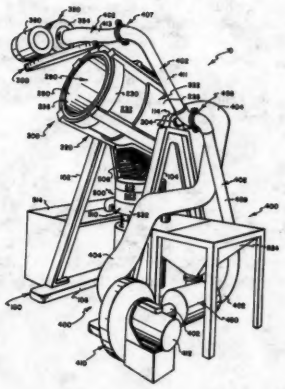
(a) receptacle means defining a treatment chamber for receiving workpieces to be deflashed, frame means for supporting the receptacle means for movement relative to the frame means, and drive means for moving the receptacle means relative to the frame means to impart movement to workpieces contained within the treatment chamber;

(b) positioning means for moving the receptacle means about a first axis relative to the frame means;

(c) throwing wheel means for receiving a supply of particulate media and a flow of cryogen gas, and for propelling media into the treatment chamber to impact workpieces within the treatment chamber;

(d) cryogen supply and recirculation means for supplying cryogen gas to the treatment chamber, and for ducting cryogen gas along a first flow path for withdrawal from the treatment chamber and for redelivery to the throwing wheel under pressure;

(e) separator means located beneath said receptacle means carried by the frame means and connected to the receptacle means for ducting particulates including reusable media from the receptacle means along a second flow path, and for segregating reusable media from such other particulates as are ducted along the second flow path;



(f) flexible bellows means communicating between said receptacle means and said separator means, for maintaining a capability for movement of the receptacle means about the first axis relative to the frame means; and,

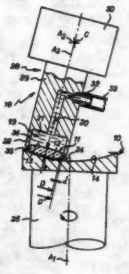
(g) media supply means located below said separator means for receiving particulate media from said separator means and introducing a metered flow of said particulate media into the pressurized flow of cryogen gas which is delivered to the throwing wheel means during operation of the apparatus.

4,598,502

METHOD AND APPARATUS FOR SURFACING OPTICAL LENSES

Gérard Lombard, Velaines, France, assignor to Essilor International Cie Generale d'Optique, Creteil, France

Filed Aug. 23, 1984, Ser. No. 643,374
Claims priority, application France, Sep. 2, 1983, 8314109
Int. Cl.[4] B24B *1/00, 13/00*
U.S. Cl. 51—284 R **13 Claims**



1. A method for surfacing an optical lens in which comprising the steps of:

providing a lens holder having a bell-shaped chamber for a lens to be surfaced and a rotatable surfacing tool;

introducing a suitably sized lens to be surfaced into the chamber such that there remains potential radial clearance between the peripheral edge of the lens and an adjacent portion of the sidewall of the chamber;

bringing the lens in the lens holder device into position relative to the surfacing tool;

supplying pressurized hydraulic fluid into the chamber so as to form a hydraulic cushion across the entire face of the lens remote from the surfacing tool, and permitting the hydraulic fluid pressure to escape between the peripheral edge of the lens and the adjacent portion of the chamber sidewall thereby forming a hydraulic film therebetween; and

imparting rotational motion to the pressurized fluid in the chamber relative to the axis of the chamber to impart a rotational motion to the lens.

4,598,503

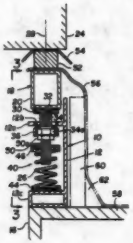
VIBRATION ABSORPTION MOUNTING FOR A ROOFTOP AIR HANDLING UNIT OR THE LIKE (II)

Richard C. Berger, Off Split Rock Rd., Syosset, N.Y. 11791, and Paul L. Berger, 28 Moss La., Jericho, N.Y. 11753

Filed Jun. 4, 1984, Ser. No. 617,267

Int. Cl.[4] F16M *9/00*; E02D *27/44*; E04B *1/36*

U.S. Cl. 52—27 **4 Claims**



1. An improved pre-assembled vibration absorption system for a rooftop mounted air handling unit or the like, comprising, in combination, at least one lower curb having a laterally extending panel adjacent an upper end thereof and edges in said panel cooperating to bound at least one opening of a selected size therein, a cooperating upper curb disposed on said lower curb, said upper curb having a threaded first bolt attached to extend in depending relation therefrom through said lower curb opening and having a bolt head on the lower end thereof, an inverted U-shaped nut threadably disposed on said threaded bolt for threaded adjustment thereon in the length portion between said bolt head and said lower curb opening, said inverted U-shaped nut being oversized in relation to said lower curb opening so as to be adjustable from a position adjacent said bolt head up along said bolt into engaged relation with said edges bounding said opening to thereby cause the bolting of said upper and lower curbs together to facilitate the handling thereof in shipment to a rooftop site, and a compressible spring-actuated lifting device disposed beneath said bolt head adapted to partake of ascending movement upon the loading of such compressible spring comprised of a vertically oriented helical spring, serving as said compressible spring, a cap having a threaded opening therein in covering relation over the upper end of said spring, and a second bolt in threaded engagement in said cap opening extending into the hollow center of said helical spring, said second bolt being positioned beneath said bolt head of said first bolt of said upper curb, whereby upon the threadable adjustment of said U-shaped nut down along said bolt into a position next to said bolt head causing the unbolting of said upper curb from said lower curb and the downward threaded movement of said cap causing the loading of said compressible spring and in turn causing ascending movement in said lifting device, there is ascending movement in said upper curb relative to said lower curb to thereby allow for vibratory movement of said upper curb relative to said lower curb to the extent permitted by said compressible spring of said lifting device.

4,598,504

WALL DISPLAY STRUCTURE

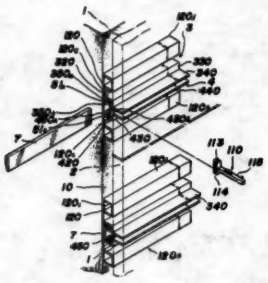
Takafumi Itagaki, Urayasu, Japan, assignor to Tamatoshi Industries Ltd., Tokyo, Japan

Filed Dec. 30, 1983, Ser. No. 566,999

Claims priority, application Japan, Mar. 3, 1983, 58-34959; Mar. 3, 1983, 58-30978

Int. Cl.[4] A47G *29/02*

U.S. Cl. 52—36 **8 Claims**



1. A wall display structure for displaying articles or the like, comprising:

a plurality of modular panels for displaying articles, said modular panels being mounted to be vertically and horizontally aligned on a mounting surface;

a plurality of hook elements for hooking the articles thereon and mounted between the vertically aligned modular panels;

first support means for holding a lower edge of an upper modular panel of first and second adjacent panels of said plurality of modular panels which are vertically aligned and mounted on said mounting surface;

second support means for holding an upper edge of a lower modular panel of said first and second adjacent panels of said plurality of modular panels, said second support means being located at a position below said first support member and extending parallel thereto, said first and second support means defining therebetween a transverse channel having a front opening and extending continuously along a longitudinal direction of said first and second support means; and

an element positioned entirely within said transverse channel for covering a portion of said mounting surface exposed through said transverse channel wherein said plurality of hook elements further comprise a hook element engaged in said transverse channel at a front side of said element and extending outward through said front opening of said transverse channel.

4,598,505

FLASHING MEMBER

Jack A. McGown, 2710 Quincannon, Houston, Tex. 77043

Filed Feb. 8, 1985, Ser. No. 699,746

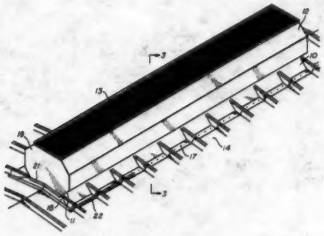
Int. Cl.[4] E04D *1/36, 13/14*

U.S. Cl. 52—58 **13 Claims**

1. The combination of an elongated roof ventilator including, (a) an internal elongated air closure cap member, (b) a lower supporting surface edge disposed along each long side of

said ventilator, and (c) a pair of supporting flashing members connected to mount said ventilator on a roof and to operatively support said air closure cap member within said ventilator, each said flashing members comprising:

(1) an elongated skirt member corrugated as appropriate to conform to the corrugations of a selected roof;



(2) an elongated uncorrugated carrier member extending in transition from said skirt and upwardly inclined over an opening in said roof, said carrier member supporting said surface edge of said ventilator;

(3) an elongated remote edge member extending from said carrier member and including an elongated bearing face for supporting said cap member; and

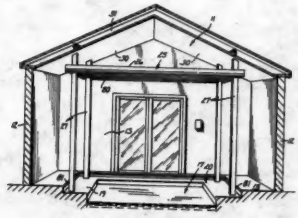
(4) said flashing member being a unitary member.

4,598,506

SWIMMING POOL COVER

Arthur H. Nohl; DeWayne A. Nohl, and Alvin L. Nohl, Jr., all of Box 214, Hancock, Minn. 56244

Filed Sep. 5, 1984, Ser. No. 647,610
Int. Cl.[4] E04B 7/16
U.S. Cl. 52—66 **13 Claims**



1. In combination with a building structure defining an interior room and having a floor and a roof, a swimming pool recessed at a level below the floor, the floor having a recessed surface portion surrounding the perimeter of the swimming pool and recessed below the normal plane of the floor, the improvement comprising a pool cover for fitting within said recess in the floor and forming an upper surface generally coplanar with the normal plane of the floor when in position adjacent the pool and including:

hoist means mounted with respect to the roof of such building structure for lifting said pool cover from a first lowered position wherein it is positioned within said recess to a second position where it is raised substantially above the normal plane of the floor to provide for space beneath the pool cover for use of the swimming pool;

vertical guide columns fixed with respect to and extending upwardly from the floor toward the roof and providing guides for the pool cover as it is moved between its raised and lowered positions, the guide columns being mounted within the periphery of the pool cover and slidably mounted in openings defined in said pool cover, and said vertical guide columns comprising vertical members defining slots, said slots extending completely through the guide columns;

retainer arms extending through said slots of at least one column and fixedly mounted at opposite ends thereof on said pool cover to prevent substantial rotation of the pool cover about a vertical axis as the pool cover is raised and lowered along said guide columns; and

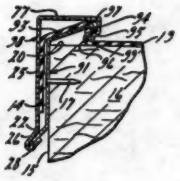
a separate flexible elongated tension carrying member associated with each column and positioned on the interior thereof, the tension carrying member having first ends coupled to the pool cover and second ends coupled to the hoist means.

4,598,507

ROOF EDGE CONSTRUCTION

John B. Hickman, Asheville, N.C., assignor to W. P. Hickman Company, Asheville, N.C.

Division of Ser. No. 309,062, Oct. 6, 1981, Pat. No. 4,549,376. This application Mar. 13, 1985, Ser. No. 711,320
Int. Cl.[4] E04D 13/15
U.S. Cl. 52—94 **10 Claims**



1. A roof-edge assembly for use on a building structure having a generally vertical outer face comprising:

a spring clip member for providing a spring force having a generally vertical portion for attaching to said outer face, said vertical portion having a lower edge and having an inwardly directed face for confronting said outer face;

said spring clip being bent along a first line to integrally define a sloping portion extending generally upwardly and inwardly from said vertical portion;

a fascia member carried on said spring clip member, said fascia member having a lower channel portion for receiving said lower edge and having a generally concave upper portion for embracing said sloping portion;

a roofing material at least a portion thereof being supported directly on said sloping portion and being gripped by said spring force between said sloping portion and said concave portion;

wherein at least said sloping portion is resiliently deflectable in response to manually applied forces to permit assembly and disassembly of said lower edge

within said lower channel portion.

4,598,508

DEVICE FOR SECURING BUILDING SHAFTS AGAINST FORCIBLE ENTRY OR PASSAGE

Albert Baum, Osterreicher Str. 10, 8572 Goldbach, Fed. Rep. of Germany

Filed Nov. 15, 1983, Ser. No. 551,864
Int. Cl.[4] E06B 3/68
U.S. Cl. 52—106 **33 Claims**

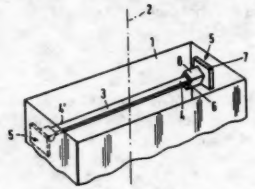
1. An apparatus for securing an access in a building wall against passage or entry comprising:

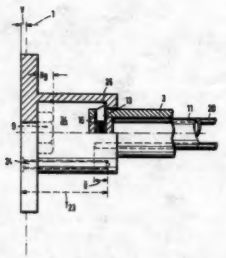
at least one hollow blocking bar having a polygonal internal and external cross-section and which extends across the access, the bar having ends fixed to respective anchor members attached by mounting means to the wall,

a security rod disposed within the bar and having substantially the same axial length as the bar, the rod having a

polygonal cross-section different from the internal cross-section of the bar,

each anchor member comprising a boss structurally integral with a base plate, the boss having an opening for receiving respective ends of the bar, the opening having a polygonal cross-section corresponding to the external cross-section of the bar so as to engage the bar, the mounting means being substantially opposite to and spaced from the ends of the bar and securing the base plate to the wall,





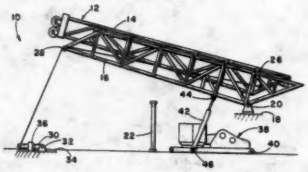
and lock means for preventing the removal of the bar ends from the opening, the lock means comprising a closure body at the ends of and closely fitted within the bar, the closure body having a diametrically extending bore, a pair of latch bodies disposed in the bore, each latch body extending through the bar and engaging the anchor member, a spring means disposed in the bore beween the latch bodies for supporting the latch bodies, the closure body having a tip on a side facing the security rod, which tip does not extend radially beyond the rod.

4,598,509

METHOD AND APPARATUS FOR RAISING AND LOWERING A TELESCOPING MAST

Homer J. Woolslayer; Cecil Jenkins, and Dewayne G. Vogt, all of Tulsa, Okla., assignors to Lee C. Moore Corporation, Tulsa, Okla.

Filed Jun. 24, 1985, Ser. No. 747,926
Int. Cl.[4] E04H *12/18, 12/10*
U.S. Cl. 52—118 **9 Claims**



1. Apparatus for raising and lowering a telescoping mast of the type having a lower section which is pivotally attached to a base and an upper section which is slidably received substantially within the lower section, said apparatus comprising:

a pulley mounted on the upper end of said lower section;

a line for placing over said pulley;

means for attaching one end of said line to the lower end of said upper section;

means for attaching the other end of said line to said base, said attaching means comprising:

a link including means for pivotally attaching one end thereof to said base;

means for attaching the other end of said line to the other end of said link; and

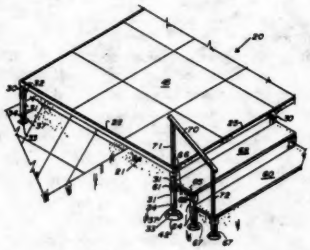
means for securing said link in a nonpivotal condition.

4,598,510

MODULAR AND EXPANDABLE PLATFORM SYSTEM

Fred A. Wagner, III, P.O. Box 607, Livermore, Calif. 94550

Filed Aug. 1, 1984, Ser. No. 636,550
Int. Cl.[4] E04B *5/02*
U.S. Cl. 52—126.6 **30 Claims**



1. A raised-platform type of structure, including in combination

a rectangular frame having four load supporting bars, two widthwise and two lengthwise fastened together at the corners,

a series of square tubular leg-providing means, one secured adjacent each corner of the rectangular frame, each leg-providing means comprising a length of square tubing disposed vertically and a flat lower end, each said leg-providing means comprising a square tubular leg receptacle open at each end secured to said frame, a square tubular leg slidable inside each leg receptacle, and separate releasable locking means for holding said leg and receptacle together positively,

a jack screw fitting loosely in each said tubular leg and extending therebelow,

a jack nut threaded on each said jack screw and abutting and supporting the flat lower end of each said leg-providing means,

a locking nut threaded on each said jack screw below said jack nut, and

a floor resting on and supported by said rectangular frame.

4,598,511

EARTH ANCHOR

Christopher W. Severs, Peckville, and William L. Leonard, Tobyhanna, both of Pa., assignors to Cooper Industries, Inc., Houston, Tex.

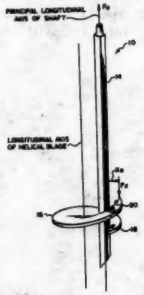
Filed Jan. 23, 1985, Ser. No. 694,090
Int. Cl.[4] E02D *5/80*
U.S. Cl. 52—157 **5 Claims**

1. An earth anchor comprising:

a hub having a principle longitudinal axis; and

a helically shaped blade having a leading edge, a trailing edge, and a central longitudinal axis about which said helical shape is generated, said blade affixed to said hub

with the principle longitudinal axis of said hub laterally offset a predetermined amount from the central longitudinal axis of said helical shape toward said leading edge with



said principal longitudinal axis of said hub, said central longitudinal axis of said helical shape of said helically shaped blade and said leading edge being generally aligned.

4,598,512

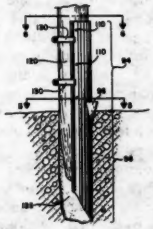
SINGLE BRACKET SUPPORT AND METHOD

Nicholas Chapman, Fremont, Calif., assignor to Fencemender Corp., Newark, Calif.

Continuation-in-part of Ser. No. 441,050, Nov. 12, 1982, Pat. No. 4,516,365. This application Dec. 17, 1984, Ser. No. 682,308

Int. Cl.⁴ E02D 5/74

U.S. Cl. 52—165 **9 Claims**



1. A bracket for fixedly supporting a structural member with respect to an aperture, comprising a generally channel-shaped body, said body having a first end portion with opposing first and second surfaces for placement on sides of the structural member, said body having a second end portion configured to extend longitudinal beyond the end of the structural member and enter the aperture, said bracket body having a plurality of corrugations extending longitudinal along said bracket body, said bracket body having a wedge shaped impact receiving portion extending outward from the body and extending between the first and the second end portions, said impact receiving portion having an upwardly facing blunt end and a downwardly facing tapered end, said impact receiving portion being positioned so that the downwardly facing tapered end extends into the aperture when the second end portion is driven into the aperture, said impact receiving portion and said corrugations applying force against a wall of the aperture when the second end portion is driven into the aperture to provide a camming action between said impact receiving portion and corrugations and the aperture wall which expands said bracket in at least one dimension to hold said bracket tightly in the aperture, and a means on said first body end portion for fixedly attaching said first body portion to the structural member.

4,598,513

BUILDING WALL CONSTRUCTION

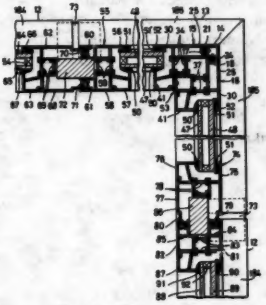
Karl Gartner, Gundelfingen, Fed. Rep. of Germany, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 5, 1983, Ser. No. 520,712

Claims priority, application Japan, Aug. 9, 1982, 57-120890[U]

Int. Cl.⁴ E06B 1/04

U.S. Cl. 52—206 **3 Claims**



1. A building wall construction for attachment to a building having an opening and a corner, comprising:

(a) a plurality of successively joined window units adapted to be mounted in the opening; and

(b) a corner window unit disposed between two adjacent ones of said window units and adapted to be mounted in the opening at the corner, said corner window unit having a preformed corner angle identical to that of the corner of the building, said corner window unit being joined to said two window units through adjustable interfitting engagement, said corner window unit having attachment projections on a side edge thereof and recesses in an opposite side edge, one of said two adjacent window units having recesses in which said attachment projections of the corner window unit are displaceably fitted, respectively, and the other of said two window units having attachment projections displaceably fitted in said recesses, respectively, in said corner window unit.

4,598,514

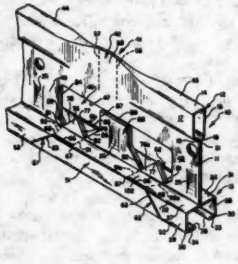
SUSPENSION CEILING GRID RUNNER WITH EXPANSION MEANS

Richard Shirey, Avon, Ohio, assignor to Donn Incorporated, Westlake, Ohio

Filed Sep. 6, 1984, Ser. No. 647,731

Int. Cl.⁴ E04C 2/52, 3/04

U.S. Cl. 52—232 **17 Claims**



1. An elongated metal grid runner for suspension ceilings comprising a central web, beamlike flange means along one

edge of said web adapted to support ceiling panels, and expansion means operable to collapse when said runners longitudinally expand, said expansion means providing an opening in said web and separation means in said flange means separating an elongated displaceable segment of said flange means from the adjacent portions thereof, expansion of said runner causing said displaceable segment to move laterally with respect to said flange means as said adjacent portions of said flange means move toward each other, said expansion means providing connecting means connecting said displaceable segment and each adjacent portion of said flange means, upon collapse of said expansion means said displaceable segment operating as a substantially rigid elongated beam extending substantially parallel to said flanges bridging between said adjacent portions of said flange means which opeates through said connecting means to maintain said adjacent portions of said flange means in substantial alignment.

4,598,515

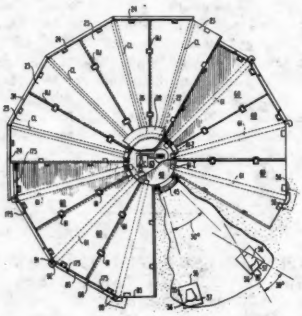
PRE-CAST BUILDING STRUCTURE

Silvio Diana, 203 Yoakum Pkwy., Alexandria, Va. 22304

Division of Ser. No. 22,131, Mar. 20, 1979, abandoned, which is a division of Ser. No. 889,320, Mar. 23, 1978, Pat. No. 4,158,941, which is a division of Ser. No. 676,590, Feb. 10, 1977, Pat. No. 4,100,705. This application Feb. 29, 1984, Ser. No. 584,952

Int. Cl.[4] E04B *1/34*

U.S. Cl. 52—236.1 **5 Claims**



1. A precast floor panel for a polygonal building comprising:

a single steel reinforced concrete beam portion having a pair of beam ends and adapted to span between a central support for one of said pair of beam ends, respectively, of a plurality of similar precast floor panels, and an outer vertical load bearing support for the other end of said pair of beam ends,

a pair of laterally extending coplanar concrete panel portions which have outer lateral edges coverging toward said one of said pair of beam ends at said central support and diverging from each other at the end of said concrete beam supported on said outer vertical load bearing support to provide a pair, and

a steel reinforcing means in said beam and said panel portions including bars at the lateral edges of each of said pairs of portions which run for substantially the entire length thereof, and wherein said one of said pair of beam ends extending beyond said coplanar panel portions and said central support to form a support for a further floor panel.

4,598,516

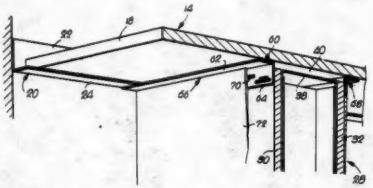
CEILING FINISH JOINT FOR DRY WALL PARTITIONS AND METHOD OF MAKING SAME

Frank E. Groshong, R.R. 3, Paola, Kans. 66071

Continuation of Ser. No. 416,990, Sep. 13, 1982, abandoned. This application Mar. 1, 1985, Ser. No. 707,183

Int. Cl.[4] E04B *2/74*

U.S. Cl. 52—241 **5 Claims**



1. A ceiling finish joint comprising:

an upright partition having an upper horizontally extending marginal edge and a vertical face below said edge;

a ceiling extending horizontally above said partition and having a downwardly facing, lower, finished surface spaced above said edge along the length of the latter to present a longitudinally extending gap;

molding having at least a portion thereof provided with an inverted, generally transversely L-shaped configuration both when the molding is detached from the partition prior to forming a part of the joint and after attachment to the partition,

said molding having a first elongated, flat leg lying flatly against and secured to said face of the partition with its longitudinal axis extending generally parallel to said edge,

said first leg spanning said gap and having an upper lateral extremity disposed upwardly beyond said edge,

said molding further having a second elongated, exposed flat leg butted flatly against and without attachment to said surface of the ceiling beside said partition with its longitudinal axis extending generally parallel to said edge,

said second leg having an outer lateral extremity spaced outwardly from said face of the partition and an inner lateral extremity integrally connected with said upper extremity of the first leg; and

a layer of mortar covering only said first leg and overlapping a portion of said face of the partition below said first leg in a manner to provide a smooth, undetectable transition from the partition to the first leg along the lower extremity of the latter and to leave said second leg exposed as a finished border along the ceiling.

4,598,517

FLOOR LAYING ARRANGEMENT

Yngve Alvarsson, Huddinge, Sweden, assignor to Tremix AB, Sweden

PCT No. PCT/SE83/00244, § 371 Date Jan. 30, 1984, § 102(e) Date Jan. 30, 1984, PCT Pub. No. WO84/00044, PCT Pub. Date Jan. 5, 1984

PCT Filed Jun. 14, 1983, Ser. No. 588,867

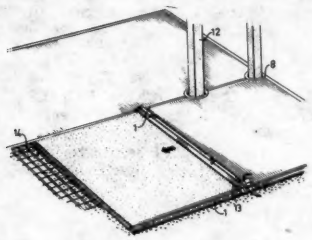
Claims priority, application Sweden, Jun. 15, 1982, 8203724

Int. Cl.[4] E04B *5/32*; B28B *7/24*

U.S. Cl. 52—364 **5 Claims**

1. An arrangement for use when casting concrete floors, particularly in locales having pillars, floor drains or other such objects passing through the floor, characterized in that said arrangement includes straight concrete beams (1) and sections of ring-like concrete beams (8) to be incorporated in the floor; the ring-like sections being arranged to co-act to at least partially encircle said objects passing through the floor, the inner surface of said sections being flat and covered with a layer of compressible material; said sections being provided with a generally horizontal lower support flange (10) for supporting

the ends of the straight beams; the height of the straight beams (1) being so selected in relation to the height of the sections of ring-like beams (8) that when said straight beams are supported



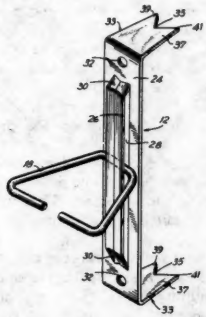
on said support flange, the upper surfaces of both types of beams are located in a common plane on a level with the resultant floor surface, in order to serve as a support path for concrete-smoothing devices (13).

4,598,518

PRONGED VENEER ANCHOR AND DRY WALL CONSTRUCTION SYSTEM

Ronald P. Hohmann, Syosset, N.Y., assignor to Hohmann Enterprises, Inc., Hauppauge, N.Y.

Filed Nov. 1, 1984, Ser. No. 667,414
Int. Cl.[4] E04B *1/38, 1/16*
U.S. Cl. 52—410 **22 Claims**



1. An improved veneer anchor apparatus for use in conjunction with a support member and comprising a substantially planar plate member having a longitudinal and a lateral dimension,

a longitudinally extending bar member having first and second spaced apart ends,

means for fixedly securing each of the ends of said bar member to said plate member in a manner whereby said bar member is disposed forwardly of said plate member in substantially parallel relationship therewith,

said plate member and said bar member forming a slot therebetween,

said plate member including first and second spaced apart end members,

said end members being angularly disposed with respect to said plate member,

said end members having piercing means on the outer ends thereof,

said piercing means being capable of piercingly penetrating wall boards, insulating layers and similar structural materials,

said piercing means being disposed in abutting engagement with said support member thereby spacing said plate member a predetermined distance from said support member, and

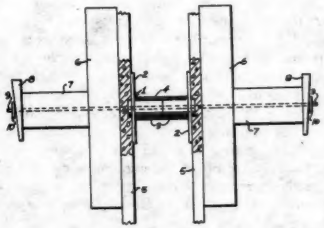
means interconnected between said plate member and said support member for positionally securing said last mentioned members with respect to one another and for preventing any undesirable movement of said veneer anchor apparatus with respect to said support member.

4,598,519

COMPOSITE CONCRETE WALLS HAVING TIE AND FORM SPACER

Daniel B. Reid, 72-797 Tampico St., Apt. A, Palm Desert, Calif. 92260

Filed Sep. 10, 1984, Ser. No. 630,822
Int. Cl.[4] E04B *2/26*
U.S. Cl. 52—426 **1 Claim**



1. A composite concrete wall comprised of a concrete filler, a pair of exterior finished facing panels for use in residential housing, and at least one expendable spacer wherein the spacer comprises a pair of caps, a sleeve, and an adhesive,

each cap has a flange with a hole cut out and a barrel, the barrel being a short tube having an inner and outer diameter, the diameter of the hole being equal to the outer diameter of the barrel, said barrel extending through the flange such that the flange is longitudinally offset from either end of the barrel, said barrel being firmly attached to said flange,

each cap is attached by an adhesive to a finished facing panel such that the barrel extends into the facing panel a distance equal to the distance which the flange is offset from one end of the barrel, said facing panel being the exterior surface of said composite concrete wall and said offset distance of said flange from said one end of the barrel being less than the thickness of said facing panel,

with each cap of each pair being attached to a respective facing panel, the caps of each pair being axially aligned, said sleeve being a second tube having a length and an inside diameter with said inside diameter large enough to slide smoothly over the outside diameter of the barrel of each of the axially aligned cap pairs and the length of the tube separating the flanges of the cap pairs and determining the thickness of the concrete filler between the facing panels,

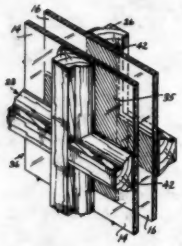
whereby said cap pairs with said sleeve are assembled in an array by said adhesive on said facing panels and these panels are rigidly held together by a tie means that does minimum damage to the facing panels so that concrete may be poured into the separation between the facing panels forming a composite concrete wall so that when the tie means are removed a wall has been formed with a finished panel surface which requires only minor repair.

4,598,520

WINDOW PANEL

Sven H. Ellstrom, c/o Ellstrom Manufacturing, Inc., 1540 NW. Ballard Way, Seattle, Wash. 98107

Filed Dec. 7, 1984, Ser. No. 679,270
Int. Cl.[4] E06B *3/70*
U.S. Cl. 52—456 **31 Claims**



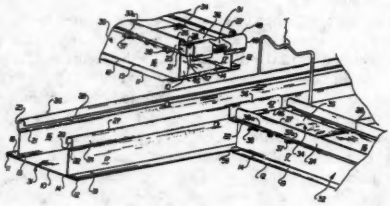
1. In an insulated widow panel that includes first and second spaced, transparent panes having corresponding first and second outwardly facing surfaces on opposite sides of said panel, the improvement in combination therewith comprising a first pseudo sash bar affixed by adhesive means to said first surface and a second pseudo sash bar affixed by adhesive means to said second surface in coincidental alignment with said first pseudo sash bar on the opposite side of said panel, the width of said pseudo sash bars relative to the distance between said first and second outwardly facing surfaces being such that said panel provides the appearance of conventional windows separated by conventional sash bars from most viewing angles and from both sides of said window panel.

4,598,521

SUSPENSION CEILING GRID WITH END CONNECTOR

Michael Slapsys, Toronto, and Brian T. Everitt, Mississauga, both of Canada, assignors to Donn Incorporated, Westlake, Ohio

Filed Sep. 5, 1984, Ser. No. 647,413
Int. Cl.[4] E04B *5/52*; E04C *2/42*
U.S. Cl. 52—484 **12 Claims**



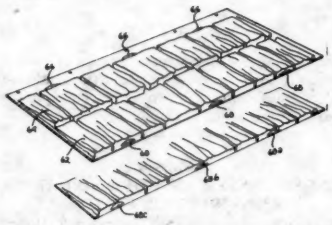
1. Elongated runners for suspension ceiling grid systems, each of said runners comprising a piece of sheet metal formed to provide a face portion extending laterally to opposed inwardly extending flanges adapted to engage and support ceiling panels, and a pair of laterally spaced substantially parallel upstanding webs, said webs extending to laterally spaced upper edges having predetermined dimensions and providing locking apertures spaced from the ends of said runner, and a separate metal end connector means connected between said webs at at least one end of at least one of said runners, said end connector means providing an inverted U-shaped portion at the end thereof sized to fit over said upper edge of an associated web of another of said runners and prevent relative axial movement of said connector with respect to an associated web, said end connector means also providing an integral tongue bendable to move the end thereof through said locking aperture from the side of said adjacent web between said webs after said U-shaped portion is positioned on said associated web to releasably lock said runner against movement relative to said associated web.

4,598,522

INTERLOCKING PANELS

William J. Hoofe, III, 1973 Port Provence, Newport Beach, Calif. 92660

Filed Jun. 22, 1984, Ser. No. 623,832
Int. Cl.[4] E04D *1/08*
U.S. Cl. 52—555 **51 Claims**



1. A panel having decorative elements, and adapted to interfit with similar panels when installed, comprising a background sheet means vacuum formed to have;

at least one decorative element means extending upward from said background sheet means and integrally formed therewith, each said decorative element means having first and second ends, said first end being adjacent said front of said sheet means, and said second end being adjacent said rear of said sheet means, said first end of at least one of said decorative element means having an integrally formed recess therein;

said second end of at least one of said decorative element means having an integrally formed protrusion therein extending over less than the width of said second end of the respective said decorative element means so as to not intersect the edges thereof, said protrusion extending over said background sheet means and having a lower surface substantially parallel to and displaced from said background sheet means;

said protrusion and said recess being cooperatively proportioned whereby when said panel is installed with similar panels in a plurality of courses of panels, the protrusion on said second end of at least one of said decorative element means of one panel may extend into the recess on said first end of at least one of said decorative element means of the panel in the next course thereabove to interlock courses of panels together.

4,598,523

REINFORCEMENT SUPPORT SPACER

Wilbur E. Tolliver, 364 Hamilton Dr., Holland, Mich. 49423

Filed Jan. 17, 1984, Ser. No. 571,567
Int. Cl.[4] E04C *5/16*
U.S. Cl. 52—685 **17 Claims**

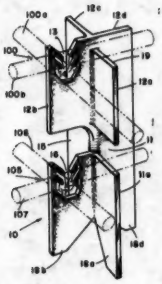
1. A reinforcement support spacer for use in spacing reinforcement members for concrete structures, said spacer comprising:

a support comprising at least two vertical webs joined together along one vertical edge of each web;

at least two recesses positioned in one of said webs for receiving reinforcement members therein; each of said recesses having opposed barbs therein for positively locking the reinforcement members into said recesses; and wherein

a second of said webs is oriented transversely of the plane of said one web;

said one web is approximately the height of said support spacer and includes one of said recesses at the top thereof; said second web is shorter than said support spacer and has a top surface defining a shoulder, whereby a first reinforcement rod or bar can be oriented in said one recess, and a second reinforcement rod or bar oriented transversely to and secured to said first reinforcement rod can be placed adjacent said support spacer, resting on or above said shoulder.



4,598,524

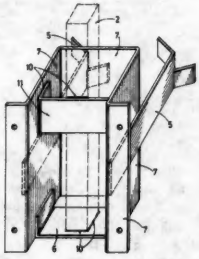
FOUNDATION OF THE HANDRAIL

Wen-Chang Cheng, 4th Floor, No. 3, Lane 14, Szu Wei Road, Taipei, Taiwan (106)

Filed Jul. 17, 1985, Ser. No. 755,895

Int. Cl.[4] E04F *11/00*

U.S. Cl. 52—708 **4 Claims**



1. A device for use as support foundation for a handrail having vertical bars said device comprising:

a. a U-shaped case having two side walls, a base and an open side opposite said base said case having open upper and lower areas dimentioned to receive a said vertical bar;

b. two anchors, each being attached to one of said side walls and extending beyond said base in a direction opposite to said open side;

c. a bottom plate positioned to receive a said vertical bar in face-to-face contact and to be welded thereto, and

d. a top plate adapted to fit between said two sidewalls and be welded to both the side walls and the said vertical bar.

4,598,525

GLAZING SYSTEM

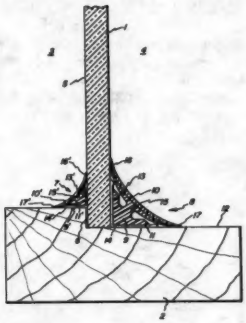
Albert C. G. Poore, New Malden, England, assignor to Sterling Drug Inc., New York, N.Y.

Filed Aug. 16, 1985, Ser. No. 766,370

Claims priority, application United Kingdom, Aug. 31, 1984, 8421969

Int. Cl.[4] A45D *42/00*

U.S. Cl. 52—776 **19 Claims**



1. A glazing system comprising a framed pane and a beading strip comprised of two co-extruded hardness grades of a rubber or plastic material, the harder grade of material forming a main body portion of the beading strip which is shaped to fit in the region where the pane adjoins a window frame, so that in use one face of the main body portion is disposed against the pane, whilst an adjacent face of the main body portion is disposed against the window frame, the softer grade of material forming a weather seal which also engages the pane.

4,598,526

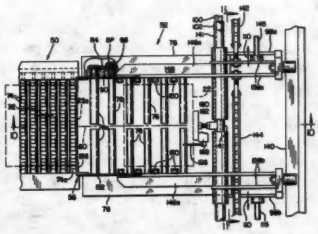
SYSTEM FOR BOXING FORMS

Timothy H. Milligan, Beaverton, Oreg., and Robert B. Johnson, Santa Clara, Calif., assignors to Willamette Industries, Inc., Beaverton, Oreg.

Filed May 11, 1984, Ser. No. 609,451

Int. Cl.[4] B65B *5/04*

U.S. Cl. 53—251 **21 Claims**



1. Apparatus for boxing forms, comprising:

dropping means for dropping a stack of forms vertically into a container receivingly positioned beneath the dropping means;

first infeeding conveyor means for infeeding a stack of forms one at a time in a predetermined direction horizontally into the dropping means; and

second infeeding means positioned beneath the first infeeding means for infeeding a container to the container-receiving position;

the dropping means including a pair of side-by-side con-

veyor means fixed at the same elevation as the first infeeding conveyor means;

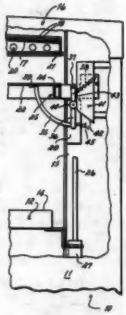
means for driving the pair of side-by-side conveyor means so as to accelerate the stack from the first infeeding conveyor means into the dropping means; and means for moving said side-by-side conveyor means horizontally apart to drop the stack of forms into the container.

4,598,527

SKIN PACKAGING MACHINE WITH TEMPERATURE SENSING PROBE

Alexander Hollingsworth, Anderson, and Stephen H. Jones, LaFrance, both of S.C., assignors to Nordson Corporation, Amherst, Ohio

Filed Oct. 18, 1984, Ser. No. 662,366
Int. Cl.[4] B65B *11/52*
U.S. Cl. 53—427 8 Claims



1. In a skin packaging machine having a base, a vacuum box mounted on said base, an oven spaced above said vacuum box, means for mounting a supply of film adjacent said vacuum box, a post, a film frame mounted on said post for vertical movement between said vacuum box and said oven, a mechanism for regulating the temperature of film supported on said film frame comprising,

a temperature probe having a sensing element,

means for pivotally mounting said probe on said frame for movement between a first position wherein said sensing element contacts the undersurface of film on said frame and a second position in which said sensing element is remote from exposure to the oven,

and means for swinging said probe to said first position as said frame is raised and for swinging said probe to a second position as said frame is lowered to a position adjacent said vacuum box.

8. In a skin packaging machine having a vacuum box, an oven spaced above said vacuum box, a film frame movable between said oven and said vacuum box, heating elements in said oven adapted to be fully energized when said film frame is adjacent said oven, a fan directing cooling air across the space between said oven and vacuum box, and a supply of film, the method of heating said film comprising the steps of,

raising said film frame with film on it to an intermediate preheat position spaced from said vacuum box and said oven,

continuously and directly monitoring the temperature of said film while said film is in said intermediate position and as said film is heated by residual heat from said oven and while said oven is not fully energized,

intermittently operating and discontinuing operation of said fans while said film frame is in said intermediate position as the temperature rises above and lowers below a predetermined temperature, respectively,

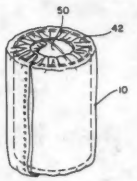
and raising said film frame against said oven for final heating of said film with said heating elements fully energized.

4,598,528

PACKAGING OF ABSORBENT PRODUCTS

Timothy M. McFarland, Winnebago County, and Arthur E. Garavaglia, Outagamie County, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Nov. 16, 1984, Ser. No. 672,017
Int. Cl.[4] B65B *63/04*
U.S. Cl. 53—430 5 Claims



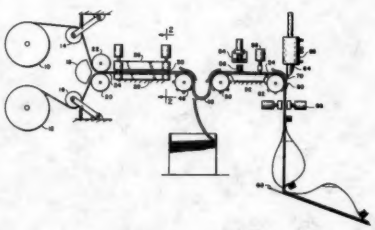
1. A method of forming a combination of a dispensing aid and a series of elasticized pads comprising forming a connected series of absorbent pads having edges that contain a heat-shrinkable elastic material, rolling said pads onto a core, said core having a length of about the width of the absorbent forming a part of said pad, placing said pads in a container and heating said container containing the roll of said pads to shrink said heat-shrinkable elastic material, so that said elasticized pad will assume a bowed condition when dispensed from said container.

4,598,529

METHOD AND APPARATUS FOR FORMING, FILLING AND SEALING FLEXIBLE PLASTIC BAGS

Robert G. Pongrass, 122 Ocean Street, Woolhara 2025 New South Wales, Australia, and Christopher C. Rutter, 21063 Cabot Blvd., Hayward, Calif. 94545

Filed Jan. 18, 1985, Ser. No. 692,539
Int. Cl.[4] B65B *3/02*
U.S. Cl. 53—452 7 Claims



1. A method for forming a web of series connected, flexible container bags from two elongated sheets of heat sealable plastic material, and for filling and sealing said bags, said method comprising the steps of:

placing the first surface of a first one of said elongated sheets against a corresponding first surface of a second one of said sheets;

heat bonding together said first and second sheets in a longitudinal strip along the edges of the joined elongated sheets to form a tubular web;

heat bonding said first and second sheets in lateral strips across said tubular web in a pattern defining a container bag, and forming a line of lateral perforations through said lateral strips for separating bags from said tubular web;

forming a line of sprocket holes along each heat bonded longitudinal strip of said tubular web, said sprocket holes being engagable with the sprockets on a rotatable sprocket wheel;

advancing said web, the first end of each bag leading the

second end thereof, to a slitting station where a lateral slit is cut through a portion of the first plastic sheet of each container bag in said web at a location adjacent the second end of the bag;

passing the longitudinal sprocket holes in said web of bags over and around a sprocket wheel to bend said web to a position at which the lateral slit will cause the first plastic sheet to separate from said second plastic sheet to form an opening into the interior of a bag;

filling said sprocket wheel suspended bag through said opening; and

heat sealing together the first and second plastic sheets in the area of said opening.

4,598,530

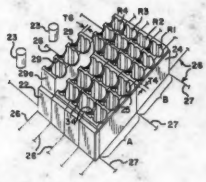
METHOD OF MANUFACTURING PACKAGING DEVICE

Joey L. Barnes, 167 D Quincy Ct., Bloomingdale, Dupage County, Ill. 60108, and James K. Barnes, 143 Spring, Glen Ellyn, DuPage County, Ill. 60137

Division of Ser. No. 521,621, Aug. 9, 1983, Pat. No. 4,549,656. This application Jun. 24, 1985, Ser. No. 747,790

Int. Cl.[4] B65B *43/00*

U.S. Cl. 53—452 **12 Claims**



1. A method of manufacturing a light weight, durable shipping container for small commodities suitable for mailing first class, comprising the steps of:

molding a billet of expanded polystyrene with outer walls having a thickness;

providing the billet with a plurality of rows of egg crate like openings;

providing said rows of openings with thin internal partitions and periodically at regular intervals providing major and minor divider walls which separate the billet into a number of columns of joined rows;

placing the billet on alignment jig of a hot wire cutting machine;

cutting the billet along the internal partitions and major divider walls and forming a plurality of individual packages;

removing the individually formed package from the cutting device.

4,598,531

SHEET MATERIAL DISPENSER AND METHODS OF DISPENSING SHEET MATERIAL AND OF WRAPPING ITEMS

Stanley L. Ruff, New Rochelle, N.Y., and Albert Stubbmann, Franklin Lakes, N.J., assignors to Clik-Cut, Inc., New Rochelle, N.Y.

Division of Ser. No. 633,019, Jul. 20, 1984. This application Oct. 28, 1985, Ser. No. 792,134

Int. Cl.[4] B65B *11/02*

U.S. Cl. 53—461 **4 Claims**

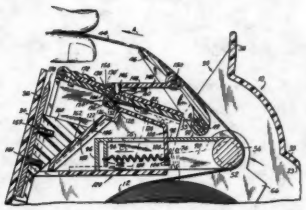
1. A method of wrapping items, comprising the steps of:

(a) mounting an elongated cutting element having cutting teeth on a housing for movement between a normally guarded position in which the cutting teeth are shielded by the housing, and a cutting position in which the cutting teeth are exposed;

(b) positioning an item to be wrapped directly in front of the cutting element;

(c) grasping a free end portion of an elongated, limp, non-self-supportable, thin, broad sheet wrapping material mounted in the housing, and pulling out a desired length of the material in a taut condition;

(d) guiding the taut material during the pulling-out step initially in a generally forward direction toward the cutting element and past the same to an elevated position spaced above the cutting element, and subsequently guiding the taut material in a generally downward direction from the elevated position toward the cutting teeth;



(e) displacing the cutting element from its normally guarded position to its cutting position, including the step of storing energy due to the initial forward movement of the taut material to the elevated position while maintaining the cutting element in said guarded position, and the step of releasing the stored energy due to the subsequent downward movement of the taut material to abruptly move the cutting element to said cutting position prior to the material making contact with the cutting teeth;

(f) moving the taut material in a generally downward direction over and past the cutting teeth to cut the material, and lowering the cut material over the item; and

(g) wrapping the item with the overlain cut material.

4,598,532

APPARATUS FOR FORMING FLAT ELEMENTS, SUCH AS TILES, INTO PACKAGES

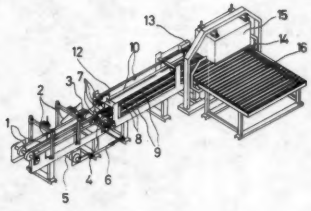
Eliseo Herrando Villanueva, C/Cid, s/n.- Poligono Torrubero, Museros (Valencia), Spain

Filed Jun. 28, 1983, Ser. No. 509,225

Claims priority, application Spain, Mar. 10, 1983, 270.789

Int. Cl.[4] B65B *27/08, 35/30*

U.S. Cl. 53—542 **1 Claim**



1. An apparatus for forming flat elements, into packages, comprising:

a linear belt means for conveying flat elements in a downstream direction;

means, mounted above the linear belt means, for turning the flat elements;

a first means, positioned at a discharging end of the linear belt means, for reorienting said flat elements from a horizontal orientation to a vertical orientation;

dual conveyor means, situated next to the reorienting means, for receiving the flat elements in a vertical orientation from the reorienting means and for rearranging the flat elements faced in pairs and grouped in packages with an intermittent forward movement;

said dual conveyor means having an upper belt and lower belts which move at the same speed and which maintain the flat elements in said vertical orientation therebetween;

said upper belt of the dual conveyor means having its face, which contacts upper edges of the flat elements, provided with a layer of soft material that absorbs pressure exerted by the flat elements having differences in height which may exist among different pieces;

said layer of soft material, provided on the face of the upper belt, being narrower than the upper belt itself and being centered thereon so that two lateral sides are formed along the upper belt;

a roller table means, located at a discharging end of the dual conveyor means, for receiving the flat elements faced in pairs and grouped in packages;

mechanical clamp means, placed above the roller table means, for pulling the upper belt along the two lateral sides thereof and for raising the upper belt when the flat elements faced in pairs and grouped in packages reach the roller table means so that said flat elements are released from the dual conveyor means;

means, mounted above the roller table means, for strapping together a predetermined number of the flat elements faced in pairs and grouped in packages after being released by the mechanical clamp means;

cutter means, movable synchronously with movement of the flat elements faced in pairs and grouped in packages along the roller table means, for guiding one side of one predetermined number of the flat elements until said predetermined number is strapped together by the strapping means, while simultaneously retaining another predetermined number of the flat elements for strapping together next by the strapping means;

means, provided underneath the dual conveyor means and the roller table means, for supporting the lower belts along their entire length so that undue friction is prevented; and

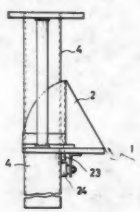
a second means, positioned at a receiving end of the dual conveying means, for assisting the first reorienting means positioned at the discharging end of the linear belt means in transferring the flat elements from the linear belt means to the dual conveyor means in a vertical orientation.

4,598,533

LATERAL SEALER DEVICE FOR VERTICAL PACKAGING MACHINE

Ichiro Takagaki, Ibaraki, Japan, assignor to Kabushiki Kaisha Sanwa Jidoki Seisakusho, Settsu, Japan

Filed Sep. 6, 1984, Ser. No. 647,668
Claims priority, application Japan, Sep. 16, 1983, 58-171760
Int. Cl.[4] B65B *51/30, 9/12, 9/20*
U.S. Cl. 53—552 **6 Claims**



1. A lateral sealer device for sealing four sides of a package in a vertical packaging machine, wherein a strip of film is wound cylindrically around the outer circumferential surface of a supply pipe by a film former so that it is formed into the shape of a bag, both side edges of the resultant film being overlapped and heat-sealed together at a position along one side of the supply pipe, the resultant film being also heat-bonded in the lateral direction to complete a packaging operation, comprising:

a lateral sealer frame provided rotatably with respect to a main frame of said packaging machine,

a pair of lateral sealer members provided on said lateral sealer frame so that said lateral sealer members can be slid toward and away from each other,

said lateral sealer frame being rotatable to any desired angle and securable at a suitably-selected position,

moding plate means, removably attached to a diametrically opposite side of said supply pipe, for outwardly bulging a portion of said package, said molding plate means being located above said lateral sealer frame, and

a pair of sealing rollers disposed below said molding plate means and above said lateral sealer frame, said pair of rollers compressing and vertically heat-bonding the bulged portion,

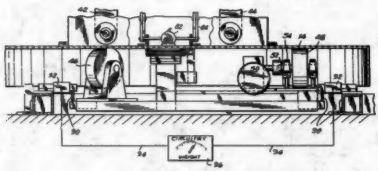
whereby after the bulged portion is sealed, two sides of the upper and lower portion of the package are sealed by said lateral sealer frame.

4,598,534

APPARATUS AND METHOD FOR CONVEYING, WEIGHING AND ROLL WRAPPING ARTICLES

Henry Rosenthal, and Howard E. Kronhaus, both of Boca Raton, Fla., assignors to Ha Di Ho, Pompano Beach, Fla.

Continuation-in-part of Ser. No. 645,712, Aug. 30, 1984. This application Mar. 29, 1985, Ser. No. 717,420
The portion of the term of this patent subsequent to May 27, 2003, has been disclaimed.
Int. Cl.[4] B65B *11/00*
U.S. Cl. 53—588 **34 Claims**



1. An apparatus for transporting and wrapping articles which comprises:

conveyor means for transporting articles to a wrapping apparatus, said apparatus including:

(a) a frame;

(b) a platform rotatably mounted on said frame and means for rotating said platform about a substantailly vertical axis;

(c) at least two elongated support rollers mounted in spaced relation on said rotatable platform for rotation about substantially horizontal axes extending therethrough;

(d) a supply of web-type wrapping material mounted on said frame, said wrapping material supply being postioned and adapted for dispensing and wrapping about an article supported on said horizontally rotatable rollers as said platform rotates about a vertical axis;

(e) means for selectively moving said supply of wrapping material in an upward and downward direction so as to selectively vary the vertical height at which said wrapping material is dispensed from said wrapping material supply;

(f) means for rotatably driving at least one of said substantially horizontal rollers in either of two directions of rotation such that an article to be wrapped rotates about a substantially horizontal axis when said driven support

roller is rotated in a first direction and said rotating article engages said other horizontal support roller and thereby rotates said other support roller in the same direction as said first driven roller;

(g) means for selectively varying the spacing between said horizontal rotatable support rollers by substantially equal and opposite movements respectively toward or away from each other to maintain said article in substantially the same location with respect to said frame and thereby providing capability to support articles of numerous sizes and weights; and

(h) weighing means positioned between said rotatable platform and said frame for generating a signal which corresponds to the weight of an article while said article is on said support rollers positioned on said frame so as to thereby provide the weight of the article.

4,598,535

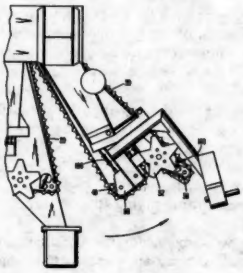
ADJUSTABLE MULTIPLE ROW HARVESTER HEAD ASSEMBLY

Eugene A. Sousek, Appleton, Wis., assignor to Piper Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 419,482, Sep. 17, 1982, Pat. No. 4,531,351. This application Nov. 13, 1984, Ser. No. 670,080

Int. Cl.[4] A01D *45/02*

U.S. Cl. 56—98 **6 Claims**



1. An adjustable multiple row head for a crop harvester comprising:

(a) a base;

(b) a plurality of row head units;

(c) a corresponding plurality of separate cantilevered support arms, each cantilevered support arm fully supporting one of said plurality of row head units;

(d) said cantilevered support arms connected to and extending forwardly of said base;

(e) at least one of said row head units including a moveable frame member adjustably pivoted about an axis;

(f) gathering means associated with said moveable frame member and forming an inlet and a passageway for crops being harvested;

(g) adjusting means for providing adjustment to said moveable frame member with respect to one of said cantilevered support arms, said adjusting means being positioned adjacent a distal end of said one of said cantilevered support arms forward of said base and inside the width of said at least one row head unit; and

(h) cutting means at the inlet,

whereby the inlets to said row head units may be spaced apart from each other and said adjusting means and separate, fully supporting cantilevered support arms provide return run for said gathering means substantially free of obstruction to allow the self cleaning of grasses from the units.

4,598,536

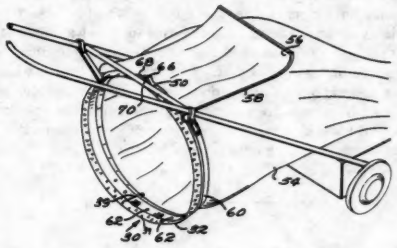
BAG ATTACHMENT AND LAWN MOWER APPARATUS

Burton Langley, Rte. 9, Hickory La., Elizabethtown, Ky. 42701

Filed May 26, 1983, Ser. No. 498,417

Int. Cl.[4] A01D *35/22*

U.S. Cl. 56—202 **29 Claims**



1. Apparatus for use with a plastic or similar type of trash, leaf or lawn clippings-receiving bag, said apparatus comprising:

a ring member defining first and second edges and an outer circumferential surface extending between said edges;

said circumferential surface defining a first annular, concave surface contiguous with said first edge for receiving an elastic band;

said circumferential surface further defining a second annular concave surface contiguous with said second edge;

said circumferential surface further defining a third annular surface extending between said first and second concave surfaces and contiguous with a predetermined portion of said second edge;

a plurality of bag-retaining members projecting from said second concave surface: and

means attached to said third annular surface adjacent to said predetermined portion of said second edge and cooperating with said bag-retaining members, for holding said bag in position on said apparatus.

4,598,537

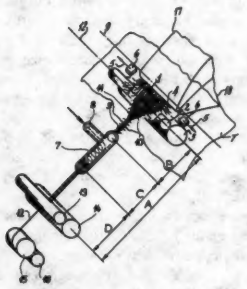
METHOD OF MANUFACTURING CORE YARNS FROM FIBER BANDS

Petr Kroupa; Rudolf Sramek, and Jiri Fantl, all of Liberec, Czechoslovakia, assignors to Elitex, koncern textilniho strojirenstvi, Liberec, Czechoslovakia

Filed Jan. 23, 1984, Ser. No. 573,045

Int. Cl.[4] D01H *5/28;* **D02G** *3/22, 3/36*

U.S. Cl. 57—5 **4 Claims**



1. Method of manufacturing core yarn, comprising drafting a staple fiber sliver in a drafting mechanism with drafting

cylinders to form a fiber band, processing the thus formed fiber band by a false twist in a twisting zone followed by an untwisting thereof, wherein the free ends of a part of the staple fibers are released by the action of an external force from the fiber band upstream of the nip of the cylinders of the drafting mechanism which feed the fiber band to the twisting zone, said force being applied within the plane of the nip of such cylinders during its drafting, and are simultaneously deflected from the direction of the main fiber band stream, the fiber band thus formed with the deflected fiber ends is then twisted by a false twist to form a twisted yarn core, the said deflected fiber ends being attached successively to the core during the untwisting of the core, and upon the spontaneous untwisting of the yarn core said fiber ends are wound about the untwisted yarn core by a true twist due to adhesion between said fiber ends thus wound about the yarn core to reinforce it.

4,598,538

METHOD AND APPARATUS FOR PRODUCING AN AIR TEXTURIZED YARN

George F. Moore, Jr., 5913 F. Quail Hollow Rd., Charlotte, N.C. 28210

Filed Sep. 14, 1984, Ser. No. 650,830
Int. Cl.[4] D02G *3/36*; D02J *1/08*
U.S. Cl. 57—7 **8 Claims**

1. A method of producing a synthetic continuous filament yarn having desirable bulk and hand characteristics, and comprising the steps of:

advancing each of at least two continuous multifilament yarn components along respective paths of travel extending between yarn feeding means and a common air jet nozzle, with a first one of said yarn components being advanced at a faster speed than that of a second one of said yarn components, said paths of travel forming an angle therebetween such that said yarn components do not contact each other at the entry end of the air jet nozzle,

moistening the advancing slower yarn component while the faster yarn component remains free from contact with the moisture, and

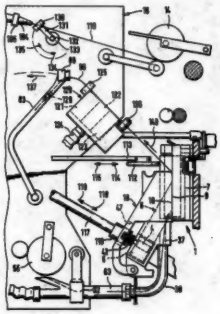
feeding the advancing yarn components concurrently through the air jet nozzle while contacting the entry end of the air jet nozzle with the moistened slower yarn component and wiping any excess moisture therefrom and while subjecting the yarn components to a high velocity jet to form loops, coils, bows or the like in the filaments thereof and produce a unitary bulked yarn.

4,598,539

YARN PIECING ARRANGEMENT FOR AN OPEN-END FRICTION SPINNING MACHINE

Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Süssen, both of Fed. Rep. of Germany, assignors to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed Oct. 23, 1984, Ser. No. 663,960
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1983, 3338833
Int. Cl.[4] D01H *7/885, 11/00, 15/02*
U.S. Cl. 57—263 **13 Claims**



1. Piecing apparatus for piecing a yarn at an open-end friction spinning unit of the type having at least one spinning unit operable at a normal operating speed with:

drivable friction surface means defining a yarn formation zone,

driving means for driving the friction surface means,

fiber feeding means for feeding separated fibers to the yarn formation zone,

yarn withdrawal means for withdrawing formed yarn from the yarn formation zone,

suction means for applying suction forces to the yarn formation zone,

and yarn winding means for winding the spun yarn on a spool, said piecing apparatus comprising:

yarn end inserting means for inserting a yarn end into the spinning unit,

friction effect control means for controlling the friction effect of the friction surface means,

fiber feed control means for controlling the quantity of fed fibers,

yarn end withdrawal means for withdrawing the yarn end and attached piecing with newly spun yarn,

piecing section cut out means for cutting out the piece of yarn containing the yarn piecing,

splicing means for making a splicing connection between the newly formed yarn end and a yarn end connected with the spool,

adjusting means for selectively reducing the spinning unit operating speed to a speed below the normal operating speed during the making of a splicing connection by the splicing means,

yarn storage device means for temporarily storing the newly formed yarn during the making of a splicing connection by the splicing means,

winding control means for controlling the winding onto the spool,

and program control means for controlling the individual operating means such that the formation of the yarn piecing and splicing connection occurs at a lower production speed as compared to normal spinning operation,

said program control means including means for controlling the individual operating means such that, after the formation of the splicing connection, winding takes place at a

speed exhibiting a difference, with respect to the speed of the yarn end withdrawal means for piecing, which is larger than the difference between the winding and yarn withdrawal speeds during the normal spinning operations, said yarn storage device means being subdivided in the travel direction of the yarn into several chambers located one behind the other, which chambers are selectively connectable to a vacuum source.

4,598,540

RING SPINNING OR TWISTING MACHINE HAVING A DEVICE FOR THE AUTOMATIC AND SIMULTANEOUS REMOVAL OF ALL FULL COPS

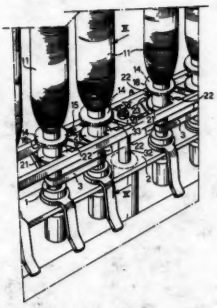
Piero Gaudino, Cossato, Italy, assignor to Officine Gaudino di P. Gaudino & C. S. a.s., Cossato, Italy

Filed Dec. 14, 1983, Ser. No. 561,073

Claims priority, application Italy, Dec. 17, 1982, 68481 A/82

Int. Cl.[4] D01H *9/02, 9/14, 9/16, 1/38*

U.S. Cl. 57—278 **33 Claims**



1. A ring spinning machine comprising:

at least one spindle for receiving a cop spool upon which yarn is formed;

a cop removal device means having grippers for removing cop spools with yarn formed thereon;

cop raising means for raising the cops to a position to accommodate removal of the cop spools by the cop removal device means;

and a yarn severing means for severing the last formed section of yarn to accommodate removal of the cop spools by the cop removal device means, wherein said yarn severing means includes means operable prior to and separately from the operation of the cop removal means.

26. A spinning machine process comprising:

spinning yarn on a cop spool received on a spindle;

severing the yarn with a severing means;

raising the cop spools with a raising means to a position to accommodate removal of the cop spools by a cop removal device means, said cop removal device means having grippers,

removing cop spools with the cop removal means independent and subsequent to yarn severance.

4,598,541

HOT GAS GENERATOR

Hiromitsu Mori, Osaka; Kosuke Akagi, Ikomashi, and Hiroki Kitahata, Hirakatashi, all of Japan, assignors to Osaka Gas Company Limited, Osaka, Japan

Filed Apr. 25, 1985, Ser. No. 727,293

Claims priority, application Japan, May 8, 1984, 59-91241; May 9, 1984, 59-93138

Int. Cl.[4] F02C *7/26*

U.S. Cl. 60—39.07 **17 Claims**

1. A hot gas generator comprising;

a combustion chamber (5) including a burner portion (5*a*) ignited by ignition means (15),

a compressor (1) for supplying compressed air to the combustion chamber (5) through compressed air conduit means,

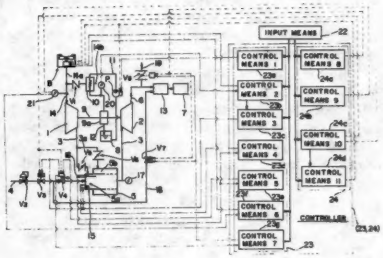
air supply means for introducing air into the compressor (1) and including a first and a second air conduits (14*a*, 14*b*) connected to the compressor (1) in parallel to each other, the first air conduit (14*a*) having a blower (B), and the second air conduit (14*b*) having a check valve (V1) to stop the air flowing in from the first air conduit (14*a*),

a hot gas discharge conduit (6) connected to the combustion chamber (5) to discharge hot gas generated in the combustion chamber (5),

a turbine (2) mounted in the hot gas discharge conduit (6) and operatively connected to the compressor (1) by a common rotary shaft supported by bearing means,

fuel gas supply means for supplying fuel gas to the burner portion (5*a*), the fuel gas supply means including a fuel gas supply conduit (4) connected to the burner portion (5*a*) and gas flow control valve means (V4) mounted in the fuel gas supply conduit (4),

input means (22) operable by an operator to provide a start command and a stop command,



air pressure sensor means (21) for detecting inlet pressures of the air supplied to the compressor (1), the air pressure sensor means (21) providing a first signal when the inlet pressures are below a predetermined pressure, and a second signal when the inlet pressures are above the predetermined pressure,

flame monitoring sensor means (16) for confirming ignition of the burner portion (5*a*) and providing a third signal, and

control means (23, 24) operable in response to the start command from the input means (22)

to actuate the ignition means (15) and open the gas flow control valve means (V4) to a certain extent at the same time,

to put the ignition means (15) out of action and open the gas flow control valve means (V4) to a predetermined extent at a predetermined opening speed at the same time upon receipt of the third signal from the flame monitoring sensor means (16), and

to stop the blower (B) upon receipt of the first signal from the air pressure sensor means (21),

and operable in response to the stop command from the input means (22)

to close the gas flow control valve means (V4) and

to actuate the blower (B) upon receipt of the second signal from the air pressure sensor means (21).

4,598,542

GAS TURBINE POWER PLANT

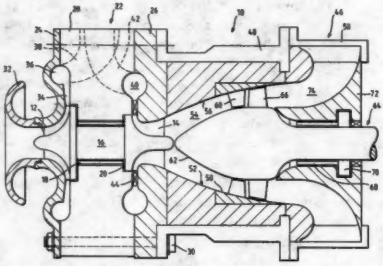
Graham A. Reynolds, Coventry, England, assignor to Rolls-Royce Limited, London, England

Filed Dec. 13, 1984, Ser. No. 681,258

Claims priority, application United Kingdom, Jan. 7, 1984, 8400356

Int. Cl.[4] F02C 3/10

U.S. Cl. 60—39.161 5 Claims



1. A gas turbine engine comprising;
a compressor-turbine housing formed of a ceramic material;
a compressor positioned at one end of said housing;
a turbine positioned at the opposite end of said housing from said compressor;
a shaft interconnecting said compressor to said turbine, said shaft being journaled in said housing in a gas bearing;
a combustion arrangement secured to said housing for receiving compressed air from said compressor and a flow of fuel, said combustion arrangement discharging the products of combustion to said turbine through said housing;
a diffuser housing connected to said compressor-turbine housing for defining the outer surface of an annular diffuser; said outer surface including a plurality of guide vanes;
a bullet defining the inner surface of said annular diffuser, a plurality of turbine blades positioned on said bullet downstream of said guide vanes to thereby form a power turbine, said products of combustion from said turbine flowing into said diffuser and through said power turbine to thereby impart rotational energy to said bullet;
and means for converting the rotational energy of said power turbine to work.

4,598,543

VARIABLE CYCLE ENGINE FOR HIGH ALTITUDE AIRCRAFT

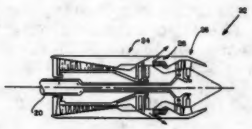
G. Daniel Brewer, Burbank, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

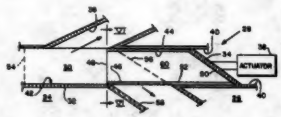
Filed Feb. 6, 1985, Ser. No. 698,720

Int. Cl.[4] F02G 1/00

U.S. Cl. 60—39.161 1 Claim

1. A propulsion system for a very high altitude aircraft, said system comprising:
a propeller having a diameter of about 50 feet, and
a variable cycle engine using a lightweight fuel for selectively driving said propeller, said variable cycle engine being able to operate in a turbojet mode and a turboprop mode, said variable cycle engine having gear means connected between said propeller and a turboshaft engine, said turboshaft engine having a high pressure turbine section, a low pressure turbine section, and an annular slide valve between said high pressure and said low pressure turbine sections, said slide valve in a first position causing said variable cycle engine to operate as a turbojet and in a second position to operate as a turboprop, said slide valve directing high pressure gas to either a jet flow passage or a prop flow passage upon translation by an actuator, said slide valve translating in an axial manner, said slide valve having a plurality of valve passages located circumferentially about said turboshaft engine, said slide valve comprising:
an annular outer ring;
an annular inner ring spaced radially inward from said outer ring;





a plurality of support walls between said outer and said inner rings;
a back wall attached to said outer ring, said inner ring, and said support structures; and
said outer ring, said inner ring, and said back wall integrally forming a plurality of valve passages whereby gas entering a front port can exit through a rear port formed in each of said valve passages, said back wall being inclined at an incline being congruent with a rear wall of a prop flow passage in said low pressure turbine section.

4,598,544

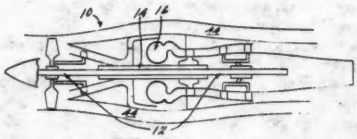
MEDIUM BYPASS TURBOFAN ENGINE

Sam B. Williams, Bloomfield Hills; John F. Jones, Berkley, and David K. Dorer, Milford, all of Mich., assignors to Williams International Corporation, Walled Lake, Mich.

Filed Apr. 28, 1983, Ser. No. 489,530

Int. Cl.[4] F02K 3/02

U.S. Cl. 60—226.1 2 Claims



1. A gas turbine engine of the turbofan type comprising
A. a generally tubular axially extending housing assembly defining a radially outer annular bypass duct extending from the inlet end of the housing assembly to the exhaust end thereof;
B. an annular burner positioned within said housing assembly radially inwardly of said bypass duct and concentric to the central axis of the housing assembly;
C. a low pressure spool assembly including a first shaft journaled on the central axis of the housing assembly, a fan on said first shaft disposed proximate the inlet end of said

housing assembly, and a low pressure turbine on said first shaft disposed proximate the exhaust end of said housing assembly; and

D. a high pressure spool assembly including a hollow second shaft telescopically received over said first shaft, a high pressure compressor on said second shaft positioned between said fan and said burner, a high pressure turbine on said second shaft positioned between said burner and said low pressure turbine, and an annular rotary slinger on said second shaft positioned between said high pressure compressor and said high pressure turbine and arranged to sling fuel radially outwardly into said burner.

4,598,545

POWER TRANSMISSION CONTROL APPARATUS

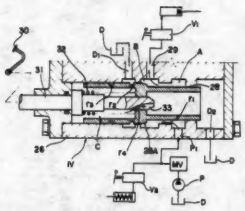
Denzaburo Harada, Katano, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Mar. 15, 1985, Ser. No. 712,071

Claims priority, application Japan, Sep. 29, 1984, 59-148336[U]

Int. Cl.⁴ F16D *25/10*

U.S. Cl. 60—435 **2 Claims**



1. A power transmission control apparatus comprising a main change speed control valve (V2), a hydraulic pump (P) for supplying pressure oil to the main change speed control valve (V2), hydraulic cylinders (18*a*–23*a*) for controlling clutches, a modulation valve (MV) disposed between the main change speed control valve (V2) and the hydraulic pump (P) for gradually increasing a hydraulic pressure for the hydraulic cylinders (18*a*–23*a*) after the hydraulic cylinders (18*a*–23*a*) are filled with the pressure oil by operating the main change speed control valve (V2) to connect the hydraulic pump (P) to the hydraulic cylinders (18*a*–23*a*), and a backward and forward switch valve (V1) connected to an output port (P1) of the modulation valve (MV) through an inching valve (IV) for controlling the clutches, wherein said inching valve (IV) comprises a valve casing (26), a tubular spool (28) slidable in the valve casing (26), and a spindle (31) slidable in and relative to the spool (28) and operatively connected to a clutch pedal (30), the valve casing (26) and the spool (28) defining therebetween a first oil chamber (A) connected to the output port (P1) of the modulation valve (MV), a second oil chamber (B) in communication with an output port (29) defined in the valve casing (26) and connected to the backward and forward switch valve (V1), and a first oil passage (r1) intercommunicating the first and second oil chambers (A,B), the spool (28) and the spindle (31) including therebetween a third oil chamber (C) and a spring (32) compressible by depression of the clutch pedal (30), the spool (28) defining a throttling portion (28A) for throttling the first oil passage (r1), and a first throttle passage (r2) and a second throttle passage (r3) for connecting the third oil chamber (C) to a first drain port (D1) defined in the valve housing (26) when the clutch pedal (30) is depressed, the first and second throttle passages (r2, r3) being disposed such that sliding of the spool (28) establishes in an alternative way an initial state in which the first throttle passage (r2) is connected to the first drain port (D1) and the second throttle passage (r3) is closed by the valve casing (26) and a declutched state in which the second and third oil chambers (B,C) are placed in communication with each other by the first throttle passage (r2) and the second throttle passage (r3) is connected to the first drain port (D1), and the spindle defining a drain passage (r4) to place the third oil chamber (C) in communication with a second drain port (D2) defined in the valve casing (26) only when the clutch pedal (30) is adjacent an inoperative position.

4,598,546

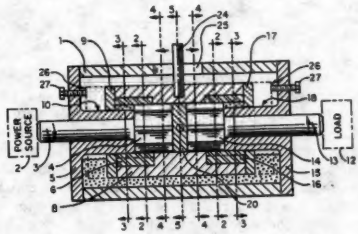
WIDE RANGE ROTARY GEAR HYDROSTATIC TRANSMISSION

Eugene M. Van Kanegan, 802 S. Hawthorne, Elmhurst, Ill. 60126

Filed Feb. 18, 1983, Ser. No. 456,863

Int. Cl.⁴ F16D *39/00*

U.S. Cl. 60—491 **1 Claim**



1. A continuously variable ratio transmission device for mechanical power comprising a single primary housing containing a rotary gear pump which through fluid displacement drives a rotary gear motor, said pump and motor each having a drive gear in fluid displacement meshing relationship with an idler gear, said pump and motor being hydraulically interconnected by a port plate which is positioned between and adjacent to the innermost sides of the pump and motor drive gears, wherein the pump and motor are of a rotary internal gear pump configuration generally known as a gerotor, said configuration comprising an externally toothed drive gear having one less tooth than an associated internally toothed idler gear, the rotational axis of said idler gear being spaced from the rotational axis of said drive gear so conjugately generated tooth profiles can maintain continuous fluid tight contact to create a series of alternately expanding and contracting chambers wherein the fluid volume displacements of both the pump and motor are variable by axially moving their idler gears relative to their drive gears, wherein the portions of pump and motor gears which are not in active fluid displacement engagement are selaed from fluid leakage between pressure and no pressure sides of the pump and motor through use of cylindrical surfaces which are close fitting to the addendum circle of those inactive portions of the pump and motor gears, the arc of each of said close fitting cylindrical surfaces being equal to or greater than the arc of one tooth space as measured at the addendum circle of its associated gear; the fluid displacements of said pump and motor being varied simultaneously in volumetrically opposite directions by the axial simultaneous movement of their idler gears means for effecting said axial simultaneous movement comprising a stack of elements which includes said pump idler gear, said motor idler gear, two end plates preventing fluid leakage at the outmost sides of the idler gears and an element positioned between and adjacent to the innermost sides of the idler gears preventng fluid leakage at the inner sides of the idler gears, said element being movable with said two end plates and said idler gear.

4,598,547

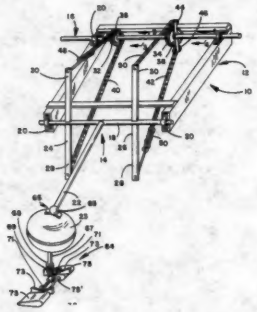
KINETIC ENERGY TRANSDUCING SYSTEM

Michael Danihel, 639 S. Irena, Redondo Beach, Calif. 90277

Filed Jun. 3, 1985, Ser. No. 740,247

Int. Cl.[4] F03B *7/12*

U.S. Cl. 60—507 **9 Claims**



1. A device for converting wave energy to mechanical motion comprising: a frame, at least one wave energy transducer each of which has a float to ride upon the undulating surface of a body of water, a rocker shaft rotatably mounted in said frame and connected to said float by a rocker arm to turn in response to movement of said float upon said undulating water surface, a pair of unidirectional clutch mechanisms coupled to said rocker shaft, a drive shaft rotatably mounted on said frame and connected to said clutch mechanisms to turn in a single direction of rotation responsive to alternative engagement of said clutch mechanisms therewith and turning movement of said rocker shaft in both directions of rotation, and a hydrofoil system for each float including a vertical shaft extending downwardly from the bottom of each float, a transverse rod which is rotatably coupled to said vertical shaft, a pair of hydrofoil wings secured to said transverse rod on opposite sides of said vertical shaft, and means for centering said hydrofoil wings acting between said vertical shaft and said transverse rod to urge said hydrofoil wings toward horizontal orientation.

4,598,548

VACUUM-OPERATED BRAKE BOOSTER

Wilfried Wagner, Hattersheim, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

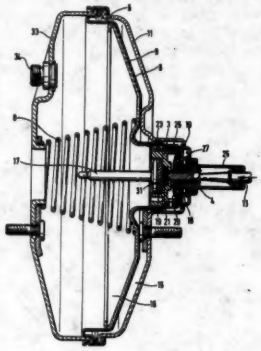
Filed Dec. 13, 1983, Ser. No. 560,810

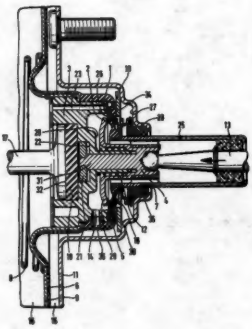
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1982, 3246085

Int. Cl.[4] B60T *13/00*

U.S. Cl. 60—547.1 **9 Claims**

1. A vacuum-operated brake booster comprising a booster piston sealed in relation to the vacuum booster housing by a rolling diaphragm, a tappet coupled to a brake pedal for the actuation of a double acting valve by means of which a working chamber of the brake booster is alternatively connectible to vacuum or higher differential pressure, wherein a first valve portion is formed by a valve seat at the booster piston and a sealing surface of a sealing ring preloaded in the direction of the valve seat, while a second valve portion is formed by said sealing ring and a valve piston connected with the tappet, the rolling diaphragm partly abuts against a diaphragm plate that engages the booster piston, the rolling diaphragm being of circular ring-shaped design and sealingly embracing a sliding sleeve which together with the valve piston is movable by the tappet and which is held and guided in an opening of the vacuum booster housing, the rolling diaphragm including said sealing surface on its side close to the booster piston cooperating with said valve piston to govern the air flow from the atmosphere to the working chamber in front of the rolling diaphragm when said piston is moved by the tappet and, further in which the slidable booster piston controls the passage from a chamber behind the rolling diaphragm to the working





chamber, and wherein the rolling diaphragm contains an abutment surface on its side remote from the booster piston which, the the brake's inactive position, abuts against a stop provided at the booster housing inner wall.

4,598,549

TURBOCHARGER MANIFOLD PRESSURE CONTROL SYSTEM

Donald S. Kanawyer, 2603 Elliot St., Santa Clara, Calif. 95051

Filed Jun. 3, 1985, Ser. No. 740,220

Int. Cl.[4] F02B *37/12*

U.S. Cl. 60—611 **3 Claims**

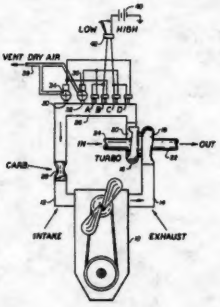
1. In a turbocharger system including a turbine driven by exhaust gasses from an internal combustion engine, a compressor driven by said turbine and operative to deliver pressurized combustion air through a connecting conduit to the intake manifold of said engine, the improvement comprising;

a plurality of electrically operable valve means having inlet ports communicatively coupled to said conduit and outlet ports operative when opened to provide venting for said pressurized air;

a plurality of pressure sensitive electrical switch means, each of which it is communicatively coupled to said conduit and operatively responsive to close at different predetermined pressures; and

a two position manual switch having a first terminal for connection to a source of electrical energy and at least two additional terminals selectively connectible to said first terminal, one of said additional terminals being elec-

trically connected to said valve means by a first sub-group of said pressure sensitive switch means, and the other of said additional terminals being connected to said valve means by a second sub-group of said pressure sensitive switch means, whereby when said manual switch is in a first position, a first one of said switch means causes one of said valve means to be opened when a first predetermined pressure level is reached in said conduit and a second one of said switch means causes said second valve means is opened when a second predetermined pressure level is reached in said conduit, and when said manual switch is in a second position a third one of said switch means causes



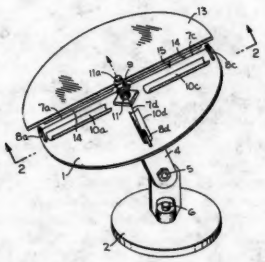
said first valve means to be opened when a third predetermined pressure level is reached in said conduit, and a fourth switch means causes said second valve means to be opened when a fourth predetermined pressure level is reached in said conduit, said first and second pressure levels being relatively low compared to said third and fourth pressure levels such that selection of said first switch position enables economy operation of said turbocharger system, and selection of said second switching position provides normal operation of said turbocharger system with said third and fourth switch means functioning to prevent overboost.

4,598,550

RADIANT HEAT ENGINE

John A. Abbott, 151 Mimosa Way, Menlo Park, Calif. 94025

Filed Dec. 10, 1984, Ser. No. 679,643
Int. Cl.[4] F03G *7/02, 7/06*
U.S. Cl. 60—641.8 **10 Claims**



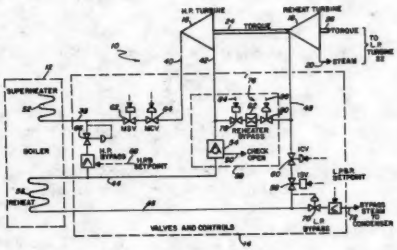
1. An engine powered by radiant heat energy, comprising means defining a radiant heat energy shade, a plurality of thermally expandable tension members, an immovable support, a shade operating mechanism for alternately removing and repositioning said shade, said tension members each having one end secured to said immovable support and the other end secured to said mechanism for alternately removing then repositioning said shade means between a radiant heat source and each said tension member causing said tension member to expand and contract as it is alternately heated by said source and then permitted to cool when the shade means is repositioned, said expansion and contraction of said tension members thus supplying at least the motive force for operation of the shade.

4,598,551

APPARATUS AND METHOD FOR CONTROLLING STEAM TURBINE OPERATING CONDITIONS DURING STARTING AND LOADING

Vladimir T. Dimitroff, Jr., Sanbornville, N.H., and James B. Wagner, Peabody, Mass., assignors to General Electric Company, Lynn, Mass.

Filed Oct. 25, 1985, Ser. No. 791,490
Int. Cl.[4] F01K *13/02*
U.S. Cl. 60—646 **13 Claims**



1. A steam turbine-generator system comprising:

a high-pressure steam turbine;

a reheat turbine;

a boiler including means for heating steam for delivery to said high-pressure steam turbine and a boiler reheat portion for reheating an exhaust steam from said high-pressure steam turbine for delivery to said reheat turbine;

main valve means for admitting steam from said boiler to said high-pressure steam turbine;

an intercept control valve for admitting steam from said boiler reheat portion to said reheat turbine;

means for maintaining at least a selectable predetermined pressure in said boiler reheat portion;

a reheater bypass assembly connected between a high-pressure turbine exhaust line of said high-pressure steam turbine and a reheat turbine inlet line of said reheat turbine, said reheater bypass assembly bypassing said reheat portion and said intercept control valve;

a check valve in said high-pressure turbine exhaust line downstream of said reheater bypass assembly; and

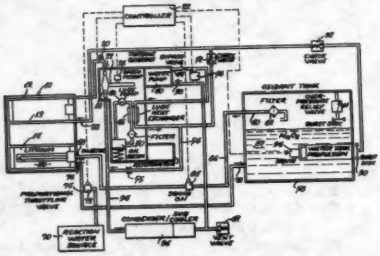
said check valve including means for preventing a flow of steam from said high-pressure turbine exhaust line to said reheat portion while an exhaust pressure of steam from said high-pressure steam turbine is less than said selectable predetermined pressure, whereby exhaust steam from said high-pressure steam turbine passes through said reheater bypass assembly directly to said reheat turbine without passing through said reheat portion during at least a portion of a startup cycle.

4,598,552

ENERGY SOURCE FOR CLOSED CYCLE ENGINE

Kent Weber, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 19, 1984, Ser. No. 633,212
Int. Cl.[4] F01K *25/00*
U.S. Cl. 60—673 2 Claims



1. An easily reusable chemical power source comprising:

a boiler including a working fluid chamber in heat exchange relation with a reaction chamber;

a closed working fluid circuit including

(a) a turbine connected to said working fluid chamber for receiving pressurized working fluid therefrom and for providing a power output;

(b) a heat exchanger connected to said turbine for receiving spent working fluid therefrom and cooling the same; and

(c) a pump connected to said heat exchanger for receiving cooled working fluid therefrom and for returning the cooled working fluid to said working fluid chamber;

a body of material exothermically reactive with water to produce a first readily water soluble compound and hydrogen in said reaction chamber said material comprising lithium;

an oxygen inlet in said reation chamber;

a storage vessel having an oxygen outlet connected to said oxygen inlet;

a body of material in said storage vessel adapted to decompose in the presence of water to generate oxygen and a second readily water soluble compound, said body of material comprising a superoxide of a Group 1A metal;

a single reaction water source; and

means for providing water from said source to (a) said reaction chamber to cause an exothermic reaction between said body of material therein and the water and to generate hydrogen in said reaction chamber, and (b) said storage vessel to generate and drive oxygen to said reaction chamber to cause an exothermic reaction between the hydrogen generated therein and the oxygen, said exothermic reactions heating the working fluid in said working fluid chamber;

said reaction chamber and said storage vessel being readily prepared for reuse by introducing a solvent(s) for the reaction products respectively therein, said solvents(s) comprising water;

said working fluid being water and said heat exchanger being a condenser, and further including a working fluid water source separate from said reaction water source and connectable to said working fluid circuit;

a check valve interposed between said working fluid water source and said circuit for allowing flow to the circuit but not the reverse; and

selectively operable means for connecting said working fluid water source and said check valve to said circuit,

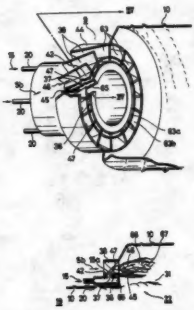
said selectively operable means comprising a squib and a burst disc, said squib, when fired, being operable to pressure said working fluid water source sufficiently to burst said burst disc and drive the working fluid water therein through said check valve to said circuit.

4,598,553

COMBUSTOR FOR GAS TURBINE

Isao Saito; Yoji Ishibashi; Takashi Ohmori; Yoshimitsu Minakawa, and Michio Kuroda, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 6, 1982, Ser. No. 375,582
Claims priority, application Japan, May 12, 1981, 56-70149
Int. Cl.[4] F02C *1/00;* F02G *3/00*
U.S. Cl. 60—733 6 Claims



1. A combustor for a gas turbine comprising:

inner cylinder means for defining a combustion chamber with a plurality of louvers for supplying air into said combustion chamber, said combustion chamber including a head combustion chamber and a main combustion chamber, said main combustion chamber being disposed downstream of said head combustion chamber and having a larger cross-sectional area than said head combustion chamber taken along a plane perpendicular to a longitudinal axis of said combustion chamber;

outer housing means for surrounding said inner cylinder means to form an air passage means communicating with said combustion chamber through said louvers;

first fuel supply means for supplying a gaseous fuel into said head combustion chamber;

first air supply means for supplying air for a combustion process into said combustion chamber, with fuel from said first fuel supply means being combusted in said head combustion chamber to form flames which flow into said main combustion chamber;

second air supply means arranged annularly and mounted adjacent to said head combustion chamber, for swirling and supplying air from said air passage means into said main combustion chamber so that air is injected substantially axially to the swirling air so as to surround the flames which flow into the main combustion chamber, said second air supply means comprises an inner cylinder extending coaxially of said inner cylinder means defining the combustion chamber, an outer cylinder surrounding said inner cylinder at a spacing therefrom, and a plurality of axially inclined vanes disposed in an annular space defined by said inner and outer cylinders and defining a plurality of air passages; and

second fuel supply means for supplying gaseous fuel into said main combustion chamber, said second fuel supply means having a plurality of inlet ports arranged such that gaseous fuel is injected so as to flow inside of air flowing from said air passage means to said main combustion chamber to contact an outside of the flames at a low flow rate of gaseous fuel and traverses the air flow from said air passage means and mixes with the injected swirling air at a high flow rate of gaseous fuel, said second fuel supply

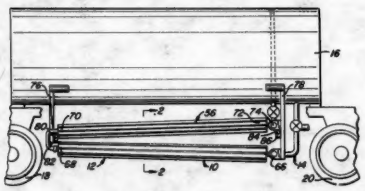
means having a plurality of fuel inlet port means each of which is disposed in a portion of said air passages near said inner cylinder.

4,598,554

CRYOGENIC PRESSURE BUILDING SYSTEM

Dale E. Bastian, San Ramon, Calif., assignor to Richmond Lox Equipment Company, Livermore, Calif.

Filed Feb. 19, 1985, Ser. No. 702,578
Int. Cl.[4] F17C 7/02
U.S. Cl. 62—51 **8 Claims**



1. A pressure building system for cryogenic material adopted for mounting in conjunction with a vehicle comprising:

a. a mobile tank supported on the vehicle said mobile tank being adapted for carrying cryogenic material;

b. at least one elongated conduit having an inner wall and an outer wall and angled upwardly, said inner wall of said conduit adapted for contacting the cryogenic material, said conduit having an inlet connected to the outlet connected to said tank of the cryogenic tank and an outlet;

c. at least one fin bonded to said outer wall of said at least one elongated conduit along the dimension of said elongation of said conduit, said conduit and said fin being constructed of heat conductive material; said at least one elongated conduit and bonded fin comprising a heat exchanger between the cryogenic material within said at least one elongated conduit, and the environment external to said at least one elongated conduit and said at least one fin bonded thereto; said fin being elongated in the direction of elongated in the direction of elongation of said conduit and having a flange there along for adding rigidity; said fin and said conduit being formed of stainless steel;

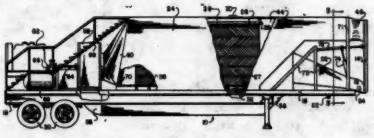
d. a support structure for mounting said at least one conduit having at least one fin to the vehicle.

4,598,555

GAS COOLER

Robert J. Windecker, West Palm Beach, Fla., assignor to Nhytemp, Inc., West Palm Beach, Fla.

Filed Oct. 14, 1985, Ser. No. 787,634
Int. Cl.[4] F25D 17/06
U.S. Cl. 62—91 **17 Claims**



1. Structure for precooling vegetation in

a. a transport container having an opening therein providing access to an interior of the transport container,

b. a true door associated with the container for covering and sealing the opening during transport and storage,

c. container refrigeration means on the transport container for maintaining a desired container temperature within the transport container that is at least the standard recommended storage temperature for said vegetation;

WHEREIN THE IMPROVED STRUCTURE COMPRISES:

d. a frame having two ends,

e. a false door on one end of the frame that is shaped to cover and seal the opening of the container,

f. the false door movably mounted on the frame for vertical and horizontal movement,

g. a heat exchange chamber on the frame,

h. a return conduit fluidly connecting the heat exchange chamber to a return port in the false door,

i. a fan on the frame having an intake of the fan fluidly connected to the heat exchange chamber,

j. a fan conduit fluidly connecting an exhaust of the fan to an inlet port in the false door,

k. a block of surface media within the heat exchange chamber,

l. distribution means within the heat exchange chamber above the block of surface media for distributing water onto the block of surface media,

m. a water inlet on the heat exchange chamber for fluidly connecting the distribution means with

n. a source of chilled water outside the heat exchange chamber,

o. the chilled water from the source of chilled water being at a water chill temperature that is at least the desired container temperature,

p. said block of surface media providing structure for the dispersion of the chilled water from the distribution means in a film over extensive surface area within the block of surface media to enhance heat exchange between the flowed gas and the film of water within the block of surface media, and

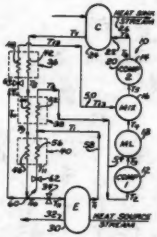
q. a water drain at a bottom of the heat exchange chamber.

4,598,556

HIGH EFFICIENCY REFRIGERATION OR COOLING SYSTEM

Raghunath G. Mokadam, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 17, 1984, Ser. No. 651,308
Int. Cl.[4] F25B 5/00
U.S. Cl. 62—117 **13 Claims**



1. A refrigeration/cooling system comprising:

a compressor having an inlet and an outlet;

a countercurrent condenser connected to said compressor outlet;

a countercurrent evaporator connected to said compressor inlet;

a heat exchanger interconnecting said condenser and said evaporator;

first throttling means interposed between said heat exchanger and said evaporator;

means for providing an at least partially expanded refrigerant to said heat exchanger and including a second throttling means connected in said system downstream of said condenser and upstream of said evaporator; and

a refrigerant return interconnecting said heat exchanger and

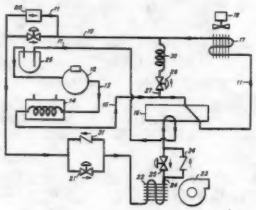
said compressor inlet for returning said at least partially expanded refrigerant to said compressor.

4,598,557

INTEGRATED HEAT PUMP WATER HEATER

Glen P. Robinson, Atlanta, and Andrew L. Blackshaw, Dunwoody, both of Ga., assignors to Southern Company Services, Inc., Atlanta, Ga.

Filed Sep. 27, 1985, Ser. No. 781,093
Int. Cl.[4] F25B 27/00
U.S. Cl. 62—238.6 14 Claims



1. An integrated heat pump water heater system for providing either heating or cooling of an interior space, and heating water in conjunction with either the heating or cooling cycle or independently, by means of a refrigerant flowing through the system, comprising:

a compressor;

a first heat exchanger means for providing heat to the interior space in the heating cycle and for removing heat during the cooling cycle by heat transfer with a refrigerant therein;

a second heat exchanger means for transferring heat to or from a refrigerant therein by heat exchanger with an exterior medium;

a third heat exchanger means for transferring heat from a refrigerant therein to water circulated therethrough;

a first expansion device;

a second expansion device;

a third expansion device;

refrigerant flow connection means connected between said compressor, said heat exchanger means, and said expansion devices which may be controllably connected in alternate configurations whereby,

in a first configuration the refrigerant flow is sequentially from said compressor, through said third heat exchanger means, through said second heat exchanger means, through said first expansion device, through said first heat exchanger means, and back to said compressor,

in a second configuration the refrigerant flow is sequentially from said compressor, through said third heat exchanger means, through said first heat exchanger means, through said second expansion device, through said second heat exchanger means, and back to said compressor,

in a third configuration the refrigerant flow is sequentially from said compressor, through said third heat exchanger means, through said third expansion device, through said second heat exchanger means, and back to said compressor;

flow connection control means for configuring said refrigerant flow connection means; and

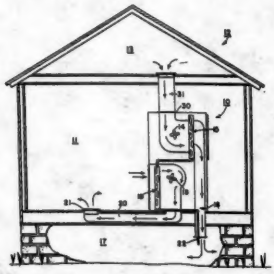
cycle control means for controlling the operation of said compressor and the rate of flow of water through said third heat exchanger means based on the configuration of the system, the temperature of the water to be heated, and the temperature of the interior space.

4,598,558

HEAT PUMP AND METHOD

Grady A. Bingham, Muscle Shoals, Ala., assignor to Thermal Concepts, Inc., Florence, Ala.

Continuation-in-part of Ser. No. 681,365, Dec. 13, 1984, abandoned. This application May 23, 1985, Ser. No. 737,270
Int. Cl.[4] F25B 13/00
U.S. Cl. 62—324.1 22 Claims



1. A heat pump having a reversible refrigerant cycle for positioning in the interior of a building to provide heating and cooling comprising: a housing, said housing spaced from vertical exterior walls of the building, said housing having vertical intake and exhaust ducts, said housing having a pair of vertically positioned compartments, one of said pair of compartments positioned over the other, one of said compartments including:

(a) a compressor,

(b) a first condenser-evaporator, and

(c) a first fan,

said second of said pair of compartments including:

(d) a second condenser-evaporator, and

(e) a second fan,

a reversing valve, said reversing valve communicating with said compressor and with said first and said second condenser-evaporators, whereby during the cooling cycle said first condenser-evaporator acts as a condenser and said second condenser-evaporator acts as an evaporator.

4,598,559

REVERSIBLE FIXED VANE ROTARY COMPRESSOR HAVING A REVERSING DISK WHICH CARRIES THE SUCTION PORT

Edward A. Tomayko, Cuyler, and Prakash N. Pandeya, Clay, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed May 31, 1985, Ser. No. 739,786
Int. Cl.[4] F25B 13/00; F04C 18/00
U.S. Cl. 62—324.6 4 Claims

1. A reversible hermetic compressor unit comprising:

shell means having first and second lines connected thereto;

rotary compressor means within said shell means;

motor means within said shell means for selectively driving said rotary compressor means in a clockwise or a counterclockwise direction;

said rotary compressor means including:

crankcase means defining a cylindrical piston chamber, first plenum means in fluid communication with said piston chamber and said first line, second plenum means in fluid communication with said piston chamber and with said second line via the interior of said shell means, and vane slot means;

rolling piston means in said piston chamber and driven by said motor means so as to maintain a line contact with said piston chamber;

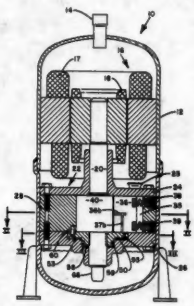
first and second discharge valve means controlling fluid

communication between said piston chamber and said first and second plenum means, respectively;

vane means reciprocably located in said vane slot means and extending into said piston chamber so as to sealingly contact said rolling piston means and thereby divide said piston chamber into a pair of chambers which define a suction chamber and a discharge chamber, respectively;

passage means formed on each side of said vane means and respectively providing fluid communication between said pair of chambers and the bottom of the corresponding side of said vane slot;

reversing disk means located beneath said rolling piston and said crankcase means and movable between two positions by coacting with said rolling piston in accordance with the direction of rotation of said rolling piston;



said reversing disk means having a slot in the upper side thereof, a circumferential groove in the lower side thereof, a pair of passage means extending through said disk means into said circumferential groove such that when said disk means is in either one of its two positions, a corresponding one of said pair of passage means is located beneath said vane slot means whereby receprocation of said vane means by said rolling piston means cyclically establishes fluid communication between said discharge chamber and said corresponding one of said passage means so as to provide a fluid pressure bias to said reversing disk means to produce a sealing engagement with said crankcase means.

4,598,560

POSITIVE TYPE YARN FEEDING DEVICE FOR KNITTING MACHINE

Masatoshi Sawazaki, Kobe, Japan, assignor to Precision Fukuhara Works, Ltd., Kobe, Japan

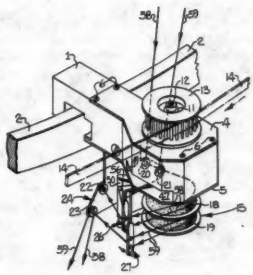
Filed Feb. 25, 1985, Ser. No. 705,370

Claims priority, application Japan, Mar. 6, 1984, 59-43624

Int. Cl.⁴ D04B *15/48*

U.S. Cl. 66—132 T **5 Claims**

1. A positive type yarn feeding device for a circular knitting machine, said yarn feeding device including rotating yarn feed wheel means rotated by said driving wheel and including at least one frictional yarn driving surface of predetermined width around the peripheral surface thereof, yarn guide means adapted for directing two turns of a double wrap of the yarn into engagement with vertically spaced arcuate portions of said frictional yarn driving surface as the yarn is fed through said yarn feeding device, said yarn guide means including yarn guide-in means for directing yarn inwardly on one side of said yarn feed wheel and into circumferential engagement with a given location on the width of said frictional yarn driving surface, movable yarn guide means supported for limited pivotal movement in spaced relationship outwardly from said frictional yarn driving surface and including a pair of vertically spaced yarn guide means engageable by the two turns of the yarn around said frictional yarn driving surface, said movable yarn guide means being operable to vary the degree of circumferential contact between the two turns of the yarn and said frictional yarn driving surface so that the degree of contact between the yarn and said frictional yarn driving surface is approximately 180 degrees and is sufficient to cause the yarn to be fed when said knitting machine makes a demand for yarn and so that the degree of contact between the yarn and said frictional yarn driving surface is approximately 90 degrees and is insufficient to cause the yarn to be fed when said knitting machine ceases to make a demand for yarn, a pair of manually movable yarn guide members supported in spaced relationship from the outer circumference of said frictional yarn driving surface, a pair of support arms having one end supported for pivotal movement about the rotational axis of said yarn feed



wheel means and supporting said movable yarn guide members on the outer ends thereof, one of said support arms being longer than the other of said support arms, said manually movable yarn guide members being spaced from each other and from said movable yarn guide means and being manually adjustable in circumferential directions to vary the degree of circumferential contact between individual turns of the yarn and said frictional yarn driving surface both when said knitting machine makes a demand for yarn and when said knitting machine ceases to make a demand for yarn and to thereby permit yarns of different frictional characteristics to be fed by said yarn feeding device, and yarn guide-out means for directing the yarn outwardly and away from the opposite side of said yarn feed wheel.

4,598,561

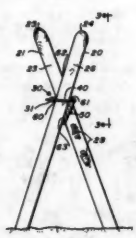
SKI LOCKING DEVICE

Donald A. Girard, P.O. Box 172, Rancho Cordova, Calif. 95670

Filed Jun. 3, 1985, Ser. No. 740,647

Int. Cl.⁴ E05B *73/00*

U.S. Cl. 70—58 **10 Claims**



1. A ski-locking device for use with a pair of crossed-over skis with their upper surfaces and the upcurved portions of their forward ends facing each other, the crossover being near

the upcurved forward ends and well forward of the ski bindings, comprising

a padlock-type of body with a securing mechanism and a pair of shackle-receiving openings therethrough having ratchet engaging members,

a shackle comprising an elongated U-shaped rod with a U-bowl at one end and a series of locking ratchets near the other end of each of two elongated rod portions, which pass through said openings for securement by said securing mechanism and body, and

a tongue member with an eye at one end encircling said rod at said U-bowl to enable swinging movement with respect to said rod and a U-shaped hook at a distal end, and a short bar secured rigidly to the tongue member near where said hook begins,

whereby with the skis crossed over, the body engages at least one side of said ski close to one of the two vertices transverse to the crossover, and the U-bowl engages the distal side of the other said ski near the opposite vertex, the U-shaped hook engages the near side of that same said other ski at the vertex between the skis, and the bar engages the other ski, with the two shackle rod portions in contact with both skis along their normally bottom surface,

so that the skis can neither be slid along nor rotated to a position where either can be removed from the lock, due partly to the orientations of their upturned end portions and to their thickening toward their bindings, and partly to the distance apart of the shackle rods and their length from the U-bowl to the body and to the length of the tongue member.

4,598,562

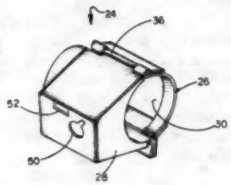
STEERING COLUMN PROTECTIVE JACKET

John T. Freeman, 36250 Hazelwood, Westland, Mich. 48124

Filed May 9, 1983, Ser. No. 492,605

Int. Cl.[4] E05B *65/12*

U.S. Cl. 70—237 **3 Claims**



1. In a vehicle, the combination comprising:

a steering column;

an ignition key housing having a generally tubular wall with an ignition key opening in the end thereof, mounted on one side of the steering column;

a turn signal lever mounted on the opposite side of the steering column;

steering column cover means mounted on the steering column adjacent the turn signal lever and the ignition key housing;

a generally semi-cylindrical jacket member removably mounted on the steering column cover means, the jacket member having a length at least as long as the length of the steering column cover means, the jacket member having an opening for passing substantially the entire tubular wall of the ignition key housing therethrough to an unenclosed position permitting manipulation of the ignition switch by a key;

a protective housing having an opening receiving the turn signal lever therethrough;

the protective housing and the jacket member having a first pair of adjacent side edges;

hinge means connecting the first pair of adjacent side edges such that the jacket member is pivotal with respect to the protective housing between an open position in which the protective housing and the jacket member may be removed from the steering column cover means, and a closed position in which the protective housing and the jacket member receive the turn signal lever and the ignition key housing through their respective openings;

the protective housing and the jacket member having a second pair of adjacent side edges;

means releasably connecting together the second pair of adjacent side edges of the jacket member and the protective housing;

whereby the jacket member and the protective housing protect the steering column cover means and steering wheel locking components mounted within the steering column cover means, but permit the user to insert and operate the ignition key mechanism without removing the jacket member and the protective housing from the steering column cover means.

4,598,563

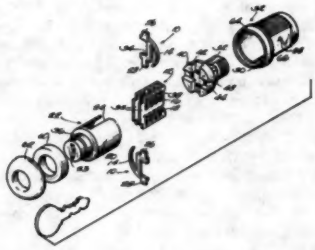
CYLINDER LOCK

Nathan L. Berkowitz, 4762 N. Cumberland Blvd., Milwaukee, Wis. 53211

Filed Jul. 2, 1984, Ser. No. 627,114

Int. Cl.[4] E05B *29/04*

U.S. Cl. 70—364 R **4 Claims**



1. A cylinder lock comprising,

a shell having a generally cylindrical interior,

a key guide having a cylindrical extension sleeve fitting inside said shell,

said shell having diametrically opposed locking grooves,

said guide extension sleeve having diametrically opposed slots generally in register with said grooves,

a tumbler plug mounted in said extension sleeve,

a plurality of tumblers mounted in a guided by said plug for movement between a locked position in which the tumblers project through said slots into said grooves and an unlocked position in which the tumblers do not engage said grooves,

spring means biasing each of said tumblers to said locked position,

said spring means comprising an integral arcuate arm on each tumbler,

each arm projecting between said plug and said extension sleeve and having a curvature similar to the interior of said extension sleeve,

each arm bearing against the interior of said extension sleeve and being flexed when the tumbler is moved,

a bolt driver rotatably mounted in said shell, and

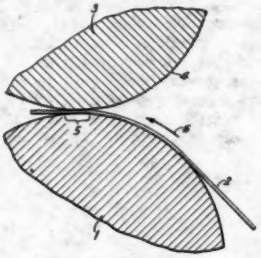
means connecting said plug to said bolt driver.

4,598,564

METHOD OF PROFILING METAL STRIPS

Kurt Held, Alte Strasse 1, 7218 Trossingen 2, Fed. Rep. of Germany

Continuation of Ser. No. 521,638, Aug. 10, 1983, abandoned, which is a continuation of Ser. No. 263,565, May 14, 1981, abandoned. This application Jul. 24, 1984, Ser. No. 634,174
Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018759
Int. Cl.[4] B21B 5/00
U.S. Cl. 72—111 3 Claims



1. A method of profiling a surface of an elongated press belt for double band presses, comprising using a roll shaped profiling tool having a profiling surface, providing spaced graduations on the profiling tool outside the profiling surface, selecting a press belt made of a metallic strip with the beginning and the end of the strip being welded together to form an endless belt having a length which is several times the circumferential dimension of the roll shaped profiling tool and is selected to form a complete press belt for use in a double band press, graduating a surface of the endless press belt outside the surface thereof to be profiled with the graduations spaced to correspond to the graduations of the profiling tool, the graduations on one surface of the press belt are made in such a manner that no protrusions are formed on the other side of the press belt, registering the graduation on the press belt with the graduation on the profiling tool, rolling the profiling tool in the rolling direction of the press belt and synchronizing the rolling of the press belt and of the profiling tool based on the registration of the graduations, reproducing the profiling surface of the profiling tool on the surface of the press belt to be profiled, forming the graduations on the press belt corresponding to a multiple whole number of the dimension of the graduations on the profiling tool so that the commencement and termination of the profiled surface of the press belt merge into one another without any visible projections.

4,598,565

SEAL STRIP BENDING DEVICE FOR STEAM TURBINES

Stewart C. Weddle, Independence, Mo., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 13, 1985, Ser. No. 701,261
Int. Cl.[4] B21D 5/14
U.S. Cl. 72—170 8 Claims

1. A seal strip bending device, said seal strip for pressure sealing a stage of a steam turbine, said seal strip consisting of an elongated metallic strip member having a substantially L-shaped cross-section, said L-shaped cross-section including a relatively long central portion and a relatively short lip portion, said device for bending said seal strip along its length to a predetermined diameter, said device comprising:

a. a frame means including a bottom horizontal support member, said bottom support member having affixed thereto at a predetermined distance from one another a pair of substantially parallel vertical wall members, said wall members affixed to said bottom support member at the bottom edges of said wall members, said wall members at the top edges thereof having affixed thereto a top horizontal support member, said top horizontal support member of predetermined dimensions;

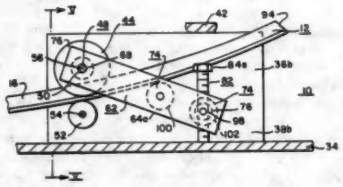
b. a first cylindrical roller means, said first roller means supported horizontally by and between said wall members, said first roller means having a first groove therein around the circumference thereof of predetermined dimensions;

c. means for supporting said first cylindrical roller means including a first cylindrical shaft means being supported by said wall members;

d. a second cylindrical roller means supported horizontally by and between said wall members with the axis of said second roller means lying in substantially the same plane as the axis of said first roller means at a predetermined distance beneath said first roller means;

e. means for supporting said second cylindrical roller means including a second cylindrical shaft means being supported by said wall members, said second shaft means in supportive relationship with said second cylindrical roller means;

f. adjustable bending means including a pair of elongated arms of substantially equal length, each of said elongated arms having first aperture means therethrough proximate one end thereof, each of said arms having said first shaft



means passing through said first aperture means of said arms in supportive relationship therewith, one of said arms positioned proximate one end of said first cylindrical roller means and the other of said arms positioned proximate the other end of said first cylindrical roller means, each of said arms movable on said first shaft means, a cylindrical bending roller means positioned between and supported by said arms at a predetermined distance from said first cylindrical roller, said bending roller means having second aperture means passing therethrough at predetermined positions, said bending roller means having first threading of predetermined size along the periphery of said second aperture means, adjustment means including screw members passing through said second aperture means engaging said first threading;

g. means for turning said first shaft means and said second shaft means; said first roller means and said second roller means spaced a predetermined clearance from one another, whereby when inserting one end of said seal strip in said first groove of said first roller means such that said lip portion of said L-shaped shaped cross-section of said seal strip is held in said clearance between said first and second roller means, upon the turning of said first and second shaft means, said seal strip is fed to contact said bending roller means, said adjustment means is adjusted to increase or decrease the diameter of the seal strip as desired.

4,598,566

FOUR-HIGH ROLL STAND WITH OFFSET WORKING ROLLS

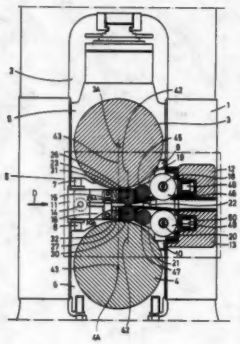
Wilfried Bald, Hilchenbach; Erich Stoy, Ratingen; Hans Römmen, Dormagen, and Hans-Friedrich Heisterkamp, Krefeld, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag AG, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 7, 1984, Ser. No. 587,231

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1983, 3308673

Int. Cl.[4] B21B *31/16*

U.S. Cl. 72—243 12 Claims



1. A roll stand comprising:

a frame;

a pair of small-diameter and substantially parallel working rolls defining a workpiece nip, whereby a strip to be rolled passes in a horizontal upstream-to-downstream direction through the nip;

respective pairs of upper and lower upstream support levers having outer ends pivoted on the frame and inner ends downstream therefrom and generally at the nip;

respective pairs of upper and lower downstream support levers having outer ends pivoted on the frame downstream of the nip and inner ends upstream therefrom and pivoted on the inner ends of the upstream levers;

respective pairs of upper and lower journal blocks mounted on the inner ends of the respective upper and lower levers and supporting the respective working rolls for rotation about substantially parallel axes vertically flanking the nip;

a pair of large-diameter and substantially parallel backup rolls flanking and bearing toward the nip on the working rolls and rotatable in the frame about substantially parallel axes vertically flanking the working-roll axes and offset therefrom in the direction; and

means including respective upstream and downstream vertically expansible hydraulic cylinders braced between the upstream and downstream levers between the respective inner and outer ends thereof for vertically bending the working rolls.

4,598,567

APPARATUS FOR CONTINUOUS EXTRUSION OF METALS

Henricus P. Backus, Past. Debetstraat 2,, 6245 CN Eysden, Netherlands

Filed Jun. 5, 1984, Ser. No. 617,505

Claims priority, application Netherlands, Jun. 6, 1983, 8302003

Int. Cl.[4] B21C *25/04, 33/00*

U.S. Cl. 72—262 5 Claims

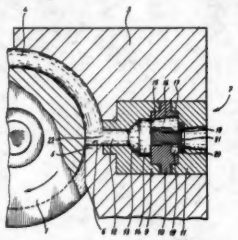
1. An apparatus for the continuous extrusion of metal wherein the surface parts of the metal to be extruded do not substantially form surface parts of the extruded metal product, comprising:

a channel having a feed end for accepting metal to be extruded, defined by a first movable member having a continuous groove and a second stationary member partially overlying the length of said groove, one wall of said channel being continuously movable with respect to another wall of said channel to feed metal supplied to said channel along said channel by friction with the generation of heat sufficient to convert said metal to a viscous fluid state, said channel being substantially closed at the end opposite the feed end, said channel including an extrusion opening in the stationary member;

a space wider than said extrusion opening in fluid communication with said extrusion opening;

a through-flow shaping die adjoined to said space, metal passing from said space to said through-flow die, and

an extrusion passage having a central flow axis providing fluid communication between said extrusion opening and said space, having a first and second portion, said first



portion of said extrusion passage having first and second ends and substantially parallel walls of a length at least equal to the transverse dimension of said extrusion passage, said second portion of said extrusion passage having first and second ends and a wall which gradually flares outwardly in a direction from said first end of said second portion of the extrusion passage to said second end of said second portion of the extrusion passage;

said first end of said first portion cooperating with said extrusion opening, said second end of said first portion cooperating with said first end of said second portion and said second end of said second portion cooperating with said space so that said extrusion passage provides fluid communication between said extrusion opening and said space so that the metal in a viscous fluid state flows sequentially through said extrusion opening along said first portion of said extrusion passage, and along said second portion into said space;

said space having a central flow axis for said metal substantially in line with the central flow axis of said extrusion passage.

4,598,568

BENDING DEVICE FOR OFFSET PRINTING PLATES

Lothar Stadler, Eppelheim, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Nov. 19, 1984, Ser. No. 672,803

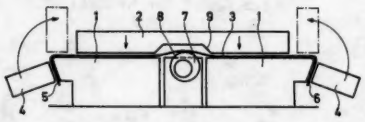
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1983, 3341924

Int. Cl.[4] B21D *5/04*

U.S. Cl. 72—320 3 Claims

1. Bending device for offset printing plates having a support plate formed with a head portion for supporting said printing plate, a respective bending bar pivotally mounted at opposite ends of the head portion for bending respective ends of a printing plate disposed on the head portion, said head portion

extending between said opposite ends lying within a single plane, a lowerable down-holder member movable relative to said head portion for holding a printing plate down against the head portion, and a positioning device for bending the printing-plate ends inregister to given printing-plate dimensions,



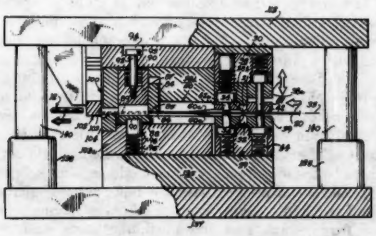
comprising adjusting means disposed parallel to the support plate between the opposite ends of the support-plate head portion, said adjusting means being selectively movable into said plane wherein a printing plate is disposed on said head portion, so as to deflect at least part of the printing plate extending between the bend ends thereof.

4,598,569

METHOD AND APPARATUS FOR MAKING GRAIN BIN FLOORING

Michael W. Carroll, Roselle, and Michael E. Harwood, Palatine, both of Ill., assignors to North American Agricultural, Inc., Schaumburg, Ill.

Filed Aug. 3, 1984, Ser. No. 637,410
Int. Cl.[4] B21D *13/02*
U.S. Cl. 72—325 **11 Claims**



1. A method of making corrugated grain bin floor plates having aeration slots therein in a progressive die in a punch press, said method comprising the steps of:

feeding a longitudinally extending strip of metal through a progressive die set in a die press;

slitting the strip at a plurality of locations in a first portion of the progressive die in a direction parallel to the longitudinal direction;

feeding the slitted section of the strip forwardly to a second portion of the progressive die; and

forming corrugations in the strip with the corrugations running parallel and longitudinally of the strip and in the elongated direction of the slits and stretching the metal while corrugating the strip to open the slits to increase the width of the slits to form the aeration slots and

severing the corrugated and slotted strip to form a floor plate.

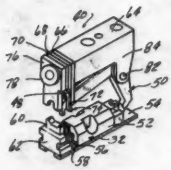
4,598,570

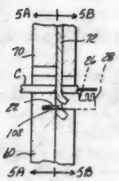
APPARATUS FOR CRIMPING ELECTRIC TERMINALS

Joseph Baldyga, 107 Bayview Isle, Islamorada, Fla. 33036

Filed Jan. 10, 1985, Ser. No. 690,256
Int. Cl.[4] B21D *28/00*
U.S. Cl. 72—338 **2 Claims**

1. In an apparatus for crimping generally U-shaped transverse cross-sectional portions of an electric terminal tightly around an electric conductor, said apparatus including an anvil having a flat vertical front surface and a terminal receiving seat at the top of said anvil extending rearwardly from said front surface, crimping die means mounted above said anvil for vertical reciprocation between a ready position spaced vertically above said anvil and a lowered crimping position adjacent said anvil, said die means being operable upon downward movement to said crimping position to crimp the U-shaped portion of a terminal supported upon said terminal receiving seat, feed means for cyclically horizontally feeding along a feed path an elongate carrier strip having terminals integrally attached at one end to one side of said strip at uniformly spaced positions therealong to advance the terminals step by step in succession to said seat with said strip disposed forwardly of said front surface of said anvil, a vertically reciprocable cutter having a flat vertical rear surface in sliding face-to-face engagement with said front surface of said anvil, means defining a horizontal carrier strip receiving slot in said cutter extending transversely across said rear surface and forwardly from said





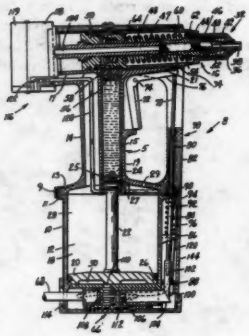
rear surface to an inner wall, said cutter being vertically movable relative to said anvil between a normally maintained rest position wherein said slot is above said anvil and an actuated position wherein said slot is located below said seat on said anvil, means engageable between said die means and said cutter for driving said cutter from said rest position to said actuated position to shear a terminal on said seat from said strip upon movement of said die means from its ready position to said crimping position, and locator means comprising only a downwardly projecting arm fixedly mounted on said die means and having a downwardly and rearwardly curved lower surface located above said strip when said die means is in its ready position, said locator means being mounted on said die means in a position relative to the carrier strip feed path to that upon downward movement of said die means from said ready position to move into engagement with said carrier strip between a terminal on said seat and the next adjacent terminal and cam said strip forwardly against said inner wall of said slot prior to the shearing of said terminal from said strip.

4,598,571

CONTROL VALVE FOR A MANDREL COLLECTION SYSTEM

Richard W. Oeflinger, Shelton, Conn., assignor to USM Corporation, Farmington, Conn.

Filed Apr. 2, 1984, Ser. No. 595,731
The portion of the term of this patent subsequent to May 21, 2002, has been disclaimed.
Int. Cl.[4] B21D 9/05
U.S. Cl. 72—391 4 Claims



1. A power operated blind rivet tool adapted to automatically pull the mandrel of a blind rivet to upset the rivet body in a workpiece comprising:

a. an upper housing containing a rivet setting mechanism;

b. a lower housing secured to said upper housing and having a pressure vessel with a piston operably connected to said rivet setting mechanism;

c. said lower housing having a downwardly extending circumferential flange having a planar surface adapted to rest on a worksurface to permit the tool to be positioned upright on the worksurface;

d. a primary air supply line passing through said flange and a central support means, with said primary air supply line being operably connected through a valve to supply air to said piston, said central support means extending to said planar surface of said flange to provide additional support area for supporting the tool upright on a worksurface;

e. a mandrel collection system on said rivet setting mechanism to retrieve the pulled mandrels;

f. a secondary air line connected to said primary air line within the confines of said flange and passing to said mandrel collection system to operate said mandrel collection system;

g. said secondary air line being positioned within the physical confines of the tool; and

h. a control valve positioned between said flange and said central support means and located within said planar surface and being operably connected in said secondary air line,

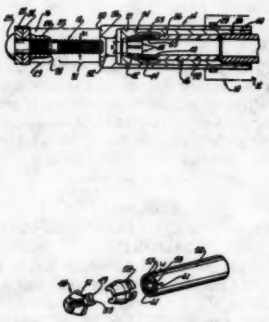
i. said control valve being accessible from the underside of said pressure vessel to control air supplied to said mandrel collection system.

4,598,572

APPARATUS AND GRIPPING JAW ASSEMBLY FOR SETTING FASTENERS

Brian C. Mondello, Tivoli, and Hendrik E. Rosier, Kingston, both of N.Y., assignors to Huck Manufacturing Company, Irvine, Calif.

Filed Feb. 4, 1985, Ser. No. 698,174
Int. Cl.[4] B21D 31/00
U.S. Cl. 72—391 14 Claims



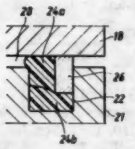
11. In a tool for setting a fastener which includes a pin member having a shank with a plurality of grooves, the invention comprising a plurality of chuck jaws each having an inner surface with a plurality of jaw teeth thereon adapted to grip at least some of the grooves of the pin member, said chuck jaws being of a rigid construction and being resiliently secured to a forward end of a support member, each of said jaws having a reduced section end portion, said support member having a plurality of elastic pockets integrally formed at said forward end and adapted to grippingly receive said reduced section end portion, said elastic pockets having a depth at least equal to the length of said end portions, each of said jaws having a seating surface from which said end portion extends, said seating surface of each of said jaws adapted to engage said forward end of said support member to locate said jaws in axial alignment with each other whereby said jaw teeth on said jaws are maintained in line with each other.

4,598,573

METHOD OF FORMING AN OBJECT BY PRESSING A BLANK IN A PRESS

Carl Bergman; Göran Holmström, and Arne Nygard, all of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed May 24, 1985, Ser. No. 737,475
Claims priority, application Sweden, May 28, 1984, 8402876
Int. Cl.[4] B21D 37/12
U.S. Cl. 72—455 9 Claims



1. A method of forming an object by pressing a blank in a

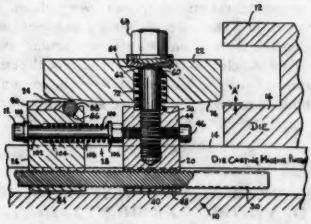
tool arranged between two pressure-transmitting parts of a press, said parts being movable in an axial direction relatively toward and away from one another, the method comprising the steps of initially locating a tool-substitute plate, which is resistant to deformation, between said pressure-transmitting parts, said plate having opposed sides respectively facing said pressure-transmitting parts and having at least one of said sides spaced from an adjacent one of said pressure-transmitting parts so as to define at least one gap therewith, locating sealing strip means at least partially into said plate at said one side thereof and bearing against said one pressure-transmitting part so as to delimit said gap in a lateral direction, introducing a formable material into said gap as delimited by said sealing strip means, pressing said parts together with said plate, said sealing means and said material therebetween and transforming said formable material into a solid force-transmitting pad, thereafter removing said tool-substitute plate and said sealing strip means from between said parts, replacing said removal plate and sealing strip means with the tool for pressing the blank and forming the object by pressing the blank with said force-transmitting pad located between the tool and the adjacent pressure-transmitting part.

4,598,574

DIE CLAMPING DEVICE

Robert W. Hegel, and William VanAppledorn, both of Holland, Mich., assignors to Prince Corporation, Holland, Mich.

Filed May 22, 1985, Ser. No. 736,656
Int. Cl.[4] B21D *37/04*
U.S. Cl. 72—481 **26 Claims**



1. A clamping device for mounting die sections on machine platens, comprising:

a movable carriage having means for slidably mounting said carriage on the face of a die carrying platen;

a clamp arm pivotally mounted on said carriage, said clamp arm having a die clamping end extending forward of said carriage and a lever end extending rearward of said carriage;

actuating means movably coupled to said carriage for advancement toward and retraction from said carriage, said actuating means including pivoting means for pivoting said clamp arm in response to advancement of said actuating means toward said carriage causing said lever end to be forced away from said platen as said actuating means advances toward said carriage thereby causing said die clamping end to be forced toward said platen for clamping onto a die section and holding said die section on said platen;

means for selectively advancing and retracting both said carriage and said actuating means relative to a platen supported die section when mounted on said platen, and for advancing said actuating means toward said carriage when said clamping end of said clamp arm is adjacent said die section in a die engaging position; and

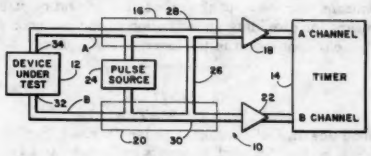
means for activating said advancing means, said activating means being spaced from said carriage and from said actuating means.

4,598,575

TIMER CALIBRATION METHOD AND APPARATUS

William G. Wilke, Arlington, Mass., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 24, 1985, Ser. No. 694,376
Int. Cl.[4] G04F *5/00*
U.S. Cl. 73—5 **19 Claims**



1. A method for generating a calibrating time for an interval timer, of the type having a first and a second input channel in which an initial signal arriving over one input channel initiates a timing cycle while a subsequent signal arriving over the other input channel terminates the timing cycle, the method comprising the steps of:

a. interconnecting remote ends of the first and second input channels by interconnecting means,

b. placing a first signal on the remote end of the first input channel such that said first signal initiates a first timing cycle after passing over said first input chaanel, and terminates the first timing cycle after passing over said channel interconnecting means and said second channel; and

c. placing a second signal on the remote end of the second input channel such that said second signal intiates a second timing cycle after passing over said second input channel, and terminates the second timing cycle after passing over said channel interconnecting means and said first input channel.

4,598,576

FLUID DETECTION DEVICE AND METHOD

Alfred D. Goldsmith, Valencia, and Roc V. Fleishman, Venice, both of Calif., assignors to National Technical Systems, Los Angeles, Calif.

Filed Jun. 25, 1984, Ser. No. 624,002
Int. Cl.[4] G01N *7/10*
U.S. Cl. 73—19 **30 Claims**

1. A gas composition detector for continuously monitoring for the presence of and capable of detecting the presence of a first gas component in an external atmosphere on a continuous basis, said detector comprising:

(a) a sealed chamber having its own internal atmosphere comprised of a gas of predetermined composition therein, said chamber being located in unrestricted communication with the external atmosphere;

(b) a semi permeable membrane associated with said chamber for permitting passage of the first gas component, whose presence in said external atmosphere is to be detected, across said membrane and into said chamber, said first gas component crossing said membrane having a

different rate of permeability than the gas of predetermined composition initially in said chamber;

(c) displaceable means operatively associated with said chamber, such that passage of the first gas component from said external atmosphere into said chamber causes movement of said displaceable means for changing the volume of said sealed chamber and with essentially no long term pressure change; and

(d) means responsive to the movement of said displaceable means for providing an indication of the presence of the first gas component in the external atmosphere.

4,598,577

ANALYSIS OF MATERIALS

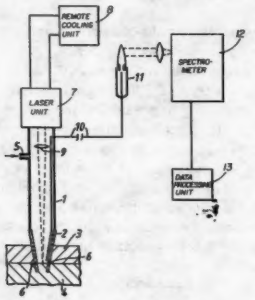
Raymond Jowitt, Guisborough, and Ian D. Abell, Saltburn-by-the-Sea, both of England, assignors to British Steel Corporation, London, England

Filed Aug. 10, 1984, Ser. No. 639,592

Claims priority, application United Kingdom, Aug. 24, 1983, 8322709

Int. Cl.[4] G01N *21/73*

U.S. Cl. 73—23 **7 Claims**



1. A method of analysing metals during production or processing thereof, comprising the steps of subjecting a surface of the metal undergoing production or processing to high energy impact by a laser to cause ablation and vapourisation such as to generate a gaseous and/or gas-borne sample comprising a complete representation of the metal, transporting all or part of the gaseous and/or gas-borne sample of the metal to a remote analytical apparatus comprising an excitation unit and a spectrometer, and analysing the gaseous and/or gas-borne sample of the metal at the remote analytical apparatus so as to determine the constituent components of the metal.

4,598,578

FLUID DENSITY MEASURING APPARATUS

Barton R. Robinson, and John W. Tanney, both of Nepean, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Jul. 24, 1984, Ser. No. 633,988

Claims priority, application Canada, Sep. 22, 1983, 437291

Int. Cl.[4] G01N *9/32*

U.S. Cl. 73—32 R **1 Claim**

1. A fluid substance density measuring apparatus, comprising:

(a) a fluid jet forming device having fluid jet orifice;

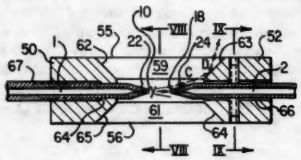
(b) connecting means for connecting a pressurized fluid source to the device so that a first fluid may be delivered thereto, at substantially constant pressure, and cause a turbulent jet of fluid to issue from the orifice into a second fluid;

(c) a receiver means having a mouth facing the orifice, and spaced therefrom, to be pressurized by the dynamic pressure of the jet therefrom, and second fluid entrained therein, within the area bounded by the receiver mouth;

(d) mounting means bridging the space between and mounting the receiver means and the device so that the space between them is a turbulent jet forming space extending a distance of less than fifty times the maximum distance across the orifice;

(e) connecting means for connecting the said receiver means to means for measuring the fluid pressure therein, for providing an indication of the density of one of the first and second fluids when the density of the other one is known;

(f) substantially all of the surfaces of the fluid jet forming device, the receiver means and the mounting means, from



which, in operation, sound waves emanating directly from the jet will be reflected, are outside the jet flow and are each inclined at an obtuse angle with respect to all of the directions along which sound waves will flow from the jet towards that surface, so that these sound waves will be generally reflected by the inclined surfaces along paths away from the jet; and

(g) the mounting means comprises two collars, with one collar mounting the receiver means and the other collar mounting the device, and two semi-circular spacer rods spacing the nozzle and the receiver means, the spacer rods have curved surfaces and the collars have cone shaped inner ends to provide the inclined surfaces with respect to the general direction along which the jet will flow.

4,598,579

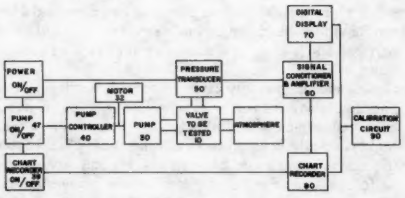
PORTABLE INSTRUMENT TO TEST PRESSURE/FLOW OF VENTRICULAR SHUNT VALVES

Joel Cummings, Ocala, and Michael D. Hooven, Miami, both of Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Oct. 23, 1984, Ser. No. 663,871

Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—37 **18 Claims**



1. A portable instrument for testing the pressure and flow characteristics of an implantable valve with a gaseous testing fluid in a substantially liquid-free testing atmosphere, said valve having an inlet port, an outlet port and a fluid passageway connecting said inlet port and said outlet port, the fluid passageway having a valve element for controlling the flow of fluid through the fluid passageway, the system comprising, in combination:

means for pumping a gaseous testing fluid through the valve at a predetermined flow rate;

means for maintaining the flow rate of the testing fluid at a

constant rate while pumping said testing fluid through said implantable valve;

means for directing the testing fluid both to said implantable valve and to a single pressure sensing device, said pressure sensing device receiving the testing fluid at the same predetermined flow rate as that received by said valve;

said pressure sensing device including a single pressure transducer having a diaphragm therein, one side of said diaphragm being mechanically coupled to said fluid directing means and the opposite side of said diaphragm being exposed to the testing atmosphere, whereby said transducer measures the difference in pressure between said testing atmosphere and the gaseous testing fluid directed to said valve and said diaphragm, said pressure sensing device further including means for producing an electrical output signal indicative of the testing fluid pressure within said valve passageway; and

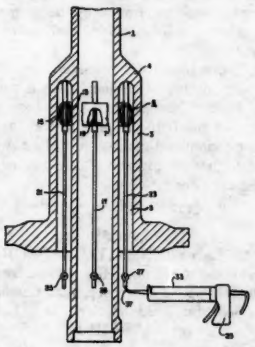
means for conditioning the electrical signal for reception by means for indicating the testing fluid pressure level in said valve passageway.

4,598,580

INFLATABLE SEAL FOR AN ANNULAR CAVITY

Gerald R. Alkire, North Coventry Township, Montgomery County; Woodrow W. Frank, Jr., West Chester, both of Pa., and Robert W. Thompson, Alief, Tex., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 2, 1985, Ser. No. 719,109
Int. Cl.[4] G01N *19/08*
U.S. Cl. 73—104 **10 Claims**



1. A seal for an annular cavity which is to be filled with a magnetic rubber mold material utilized to inspect surfaces lining said cavity, said seal comprising:

a tubular member sealed on each end thereof and formed into a circle with the sealed ends thereof engaging to form a circular ring;

means for inflating said tubular member to form a seal within said cavity; and

means for supplying magnetic rubber mold material through said tubular member and into said cavity.

4,598,581

QUICK CONNECT DIAGNOSTIC SYSTEM

Carroll E. Brekke, San Jose, Calif., assignor to FMC Corporation, Chicago, Ill.

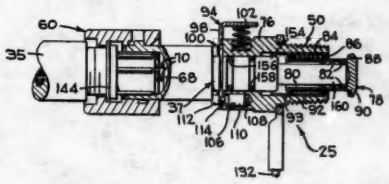
Filed Jun. 25, 1984, Ser. No. 623,879
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—117.3 **13 Claims**

1. A quick connect diagnostic system comprising:

means defining a fluid flow passage with a fluid stream flowing therethrough;

means defining a first portion of a quick connect mechanism having a normally closed valve therein secured to said flow passage means in communication with the fluid stream and movable between said closed position and an open position permitting fluid to flow therepast;

means defining a second portion of the quick connect mechanism which includes a probe for opening said foot valve when coupled with said first portion, said first and second portions including at least one seal member therein which seals the first and second portions together prior to opening said foot valve;



means defining a quick connect latch for releasably latching said first and second portions together when coupled together;

a transducer connected to said probe detecting a signal indicative of a characteristic of said fluid in said flow passage; and

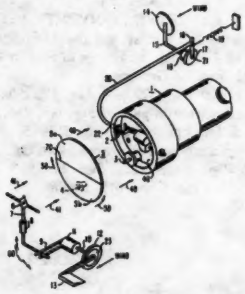
meter means coupled to said transducer for providing a reading indicative of the fluid characteristics being tested, said probe being a temperature probe which enters the stream of fluid in said fluid flow passage for determining the temperature of the fluid.

4,598,582

BANK AND PITCH INDICATOR

Richard D. Henry, Hookstown Grade Rd. R.D. #1 Box 331-A, Clinton, Pa. 15026

Filed Jul. 11, 1984, Ser. No. 629,850
Int. Cl.[4] G01C *21/00*
U.S. Cl. 73—178 R **11 Claims**



1. An aircraft instrument for indicating the roll and pitch of an aircraft comprising a rotatable disk having a face portraying sky above a demarcation line and earth below, a rate gyro responsive to roll of the aircraft connected to the disk effecting rotation thereof to position the demarcation line in a manner indicative of a roll condition of the aircraft, an air paddle responsive to the relative airstream connect to move a gimbal cage of the rate gyro to compensate for variations in the roll sensitivity of the rate gyro due to changes in airspeed, a rear view aircraft silhouette positioned in front of the disk for relative vertical movement with respect to the demarcation line on the disk, an angle of attack vane responsive to the

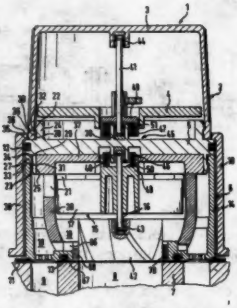
relative airstream connected to move the silhouette to indicate the pitch of the aircraft.

4,598,583

METERING CELL

Eberhard Steinhauser, Hansjakobstr. 13, D-7741 Vöhrenbach 1, Fed. Rep. of Germany

Filed Dec. 6, 1983, Ser. No. 558,498
Int. Cl.[4] G01F *5/00, 15/14*
U.S. Cl. 73—202 **5 Claims**



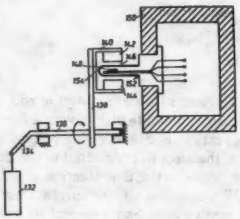
1. A metering cell for metering the flow of fluids including a metering component and a register component, one of said components comprising an annular projection having a radially extending peripheral lip for engaging a radially-extending elevation defining a recess in the other of said components, said metering component comprising an impeller and adjustment means for adjusting the rotational speed of said impeller, said adjustment means comprising an adjustment ring and a hole forming a bypass with respect to said impeller, said adjustment ring having an angularly increasing height and being rotatably adjustable in that manner that a first section of the adjustment ring covers said hole to an extent depending on the rotational position of said adjustment ring.

4,598,584

ELECTRIC MEASURING CONVERTER FOR LEVEL

Ferdinand Dombrowski, Kaarst, and Dieter Förster, Haan, both of Fed. Rep. of Germany, assignors to Sunvic Regler GmbH, Solingen, Fed. Rep. of Germany

Continuation of Ser. No. 572,094, Jan. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 459,172, Jan. 19, 1983, abandoned. This application Aug. 6, 1985, Ser. No. 764,501
Claims priority, application European Pat. Off., Jan. 20, 1983, 83100455; Fed. Rep. of Germany, Jan. 30, 1982, 3203110
Int. Cl.[4] G01F *23/38*
U.S. Cl. 73—308 **4 Claims**



1. In an electrical level measuring transducer for generating an electric signal representing the instantaneous liquid level of a substance inside a container, including a float disposed inside the container moving in response to changes in the liquid level, and means for converting the float movement into said electric signal, including permanent magnet means adapted to be moved by the float movement and a Hall generator adjacent the permanent magnet means for generating the electric signal, the improvement comprising:

the permanent magnet means including a pair of permanent bar magnets mounted adjacent to each other in a parallel arrangement to define a uniform coextensive air gap therebetween, with a first end of the air gap having the North pole of one permanent bar magnet adjacent the South pole of the other permanent bar magnet and a second end of the air gap having the South pole of the one permanent bar magnet adjacent the North pole of the other permanent bar magnet, to thereby form a linearly varying distribution of magnetic flux density B between the first and second ends of the air gap;

a tightly closed housing located adjacent the pair of permanent magnets, the housing having walls to substantially seal the housing interior from the environment;

a non-magnetic wall portion in one of the housing walls facing the pair of permanent magnets, including an elongated hollow body protruding outwardly from the wall with a closed end in the air gap between the pair of permanent magnets;

mounting means for mounting the Hall generator within the elongated hollow body and at the closed end thereof to enable the pair of permanent bar magnets, in response to the float movement, to be displaceably moved over the Hall generator in a range of displacement with respect to the Hall generator defined from the first end of the air gap to the second end of the air gap or vice versa, and wherein the electric signal representing the instantaneous liquid level is generated in the elongated hollow body by the Hall generator; and

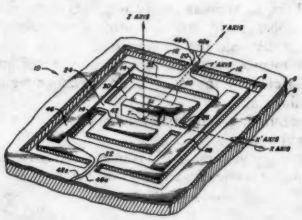
said pair of permanent magnet means providing a linearly varying distribution of magnetic flux density B over said range of displacement of the magnets over the Hall generator between the first and second ends of the air gap to enable a continuous linearity in said electric signal to be obtained for measuring the instantaneous level of liquid inside the container.

4,598,585

PLANAR INERTIAL SENSOR

Burton Boxenhorn, Chestnut Hill, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Mar. 19, 1984, Ser. No. 591,007
Int. Cl.[4] G01P *15/02*
U.S. Cl. 73—505 **30 Claims**



1. A planar inertial sensor having an input (Z) axis, comprising a sheet member and associated base member, said base member including means for supporting the peripheral region of said sheet member in a plane perpendicular to said input (Z) axis, said plane including a first (X) reference axis and a second (Y) reference axis, said first and second reference axes being mutually perpendicular and intersecting said input axis at a common point,

wherein said sheet member encloses a first pair of opposed

C-shaped void regions and said first pair of void regions being disposed symmetrically about said second axis and said common point,

wherein the portions of said sheet member between the opposed ends of the void regions of said first pair and the portions of said sheet member interior to said first pair of void regions are spaced apart in the direction of said Y axis from said base member, and

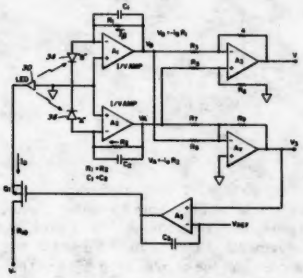
wherein the portions of said sheet member between the opposed ends of said void regions of said first pair are flexible, whereby said common point is constrained to be substantially in said plane, and further comprising means for sensing inertial changes in position of said support means.

4,598,586

COMPENSATION OF GAIN TEMPERATURE COEFFICIENT IN AN OPTICAL PICK-OFF FOR AN ACCELEROMETER

Michael S. Danielson, Wrentham, Mass., assignor to Northrop Corporation, Century City, Calif.

Filed Aug. 31, 1984, Ser. No. 646,150
Int. Cl.[4] G01P *15/13*
U.S. Cl. 73—517 B 3 Claims



1. In an accelerometer including a mass diposed within an optical sensing means and closed loop means for maintaining said mass substantially at a null position within said optical sensing means during acceleration, said optical sensing means comprising:

a light emitting source;

a dual element photodiode detector spaced apart from said source and located for equal illumination of each element of said dual element photodiode by said source, the motion of said mass altering said equal illumination;

electrical means for producing a first signal proportional to the difference in output from the two elements of said dual element photodiode detectors; and

electrical means for producing a second signal proportional to the sum of the outputs from the two elements of said dual element photodiode detector,

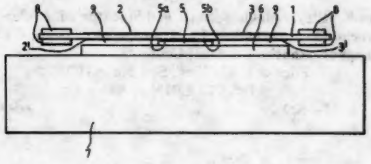
said second signal utilized to alter the current to said light emitting source to maintain said second signal at a predetermined reference level.

4,598,587

SURFACE ACOUSTIC WAVE ACCELEROMETER

Douglas F. G. Dwyer, Bishops Stortford, and David E. Bower, London, both of England, assignors to Standard Telephones & Cables, plc, Harlow, England

Filed Jul. 16, 1984, Ser. No. 631,249
Claims priority, application United Kingdom, Aug. 4, 1983, 8321091
Int. Cl.[4] G01P *15/08*
U.S. Cl. 73—517 R 9 Claims



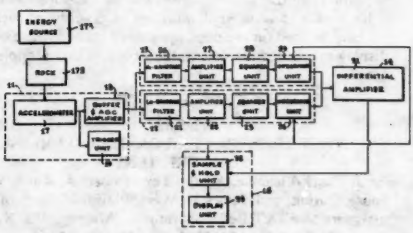
1. A surface acoustic wave accelerometer including a respective surface acoustic wave device on each of two opposing surfaces of a resilient beam, wherein the beam has a portion central of its length by which it is mounted to a substrate with one beam surface facing the substrate, to provide a balanced structure, and wherein each surface acoustic wave device has a respective pair of transducers, the transducers of each pair being disposed on opposite sides of said beam central portion whereby surface acoustic waves produced by said devices propagate between the respective transducers and across said beam central portion.

4,598,588

DETACHED ROCK EVALUATION DEVICE

David R. Hanson, Golden, Colo., assignor to The United States of America as represented by the Secretary of Interior, Washington, D.C.

Filed Jan. 22, 1985, Ser. No. 693,510
Int. Cl.[4] G01H *1/14*
U.S. Cl. 73—584 9 Claims



1. A detached rock evaluation device comprising:

(a) energy transducer means for sensing vibrations in rock and for converting said vibrations into electrical signals;

(b) low band pass filter means for receiving said electrical signals and transmitting only a low frequency segment thereof;

(c) high band pass filter means for receiving said electrical signals and transmitting only a high frequency segment thereof that comprises a base line signal for comparison with said low frequency segment;

(d) comparison means for receiving said low frequency segment and said high frequency segment and for determining when said low frequency segment exceeds in power said base line signal;

(e) trigger means operably attached to said energy trans-

ducer means for receiving said electrical signals and for allowing said high frequency segment and said low frequency segment to be received by said comparison means only in response to receiving said electrical signals; and

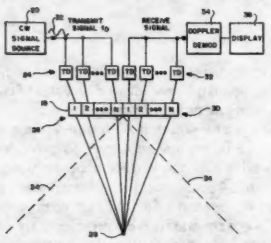
(f) display means for displaying indicia of when said low frequency segment exceeds in power said base line signal.

4,598,589

METHOD OF CW DOPPLER IMAGING USING VARIABLY FOCUSED ULTRASONIC TRANSDUCER ARRAY

James E. Riley, Shingle Springs, and Stockton M. Miller-Jones, Rancho Cordova, both of Calif., assignors to General Electric Company, Rancho Cordova, Calif.

Filed Jul. 17, 1984, Ser. No. 631,735
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—609 **9 Claims**



6. A CW Doppler imaging system comprising

a source of a CW electrical signal,

a linear array of transducer elements having a central axis,

a first plurality of time delay means connected to said signal source and to a first plurality of transducer elements for applying said electrical signal to said first plurality of transducer elements, said first plurality of transducer elements being located on one side of said central axis of the transmitted CW ultrasonic beam,

Doppler demodulator circuitry,

a second plurality of time delay means connecting a second plurality of transducer elements to said Doppler demodular means, said second plurality of transducer elements being located on the opposite side of said central axis, and

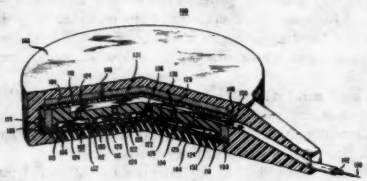
display means for displaying the demodulated Doppler signal.

4,598,590

ELECTRET TRANSDUCER FOR BLOOD PRESSURE MEASUREMENT

Ilene J. Busch-Vishniac, Austin, Tex.; Robert A. Kubli, Whitehouse Station, and James E. West, Plainfield, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 14, 1984, Ser. No. 651,043
Int. Cl.[4] G01L *9/12*
U.S. Cl. 73—724 **11 Claims**



1. A pressure transducer comprising:

a back electrode having two sides with spaced ridges on one side thereof and valley portions disposed between said ridges on said one side; and

an electret foil having a metalized surface and a charged non-metalized surface; said charged non-metalized surface facing said ridged side of the back electrode and spaced from said back electrode valley portions by said ridges;

the electret foil being responsive to the pressure applied thereto increasing above a first predetermined value to deflect the foil into contacts with the valley portions of said back electrode, and

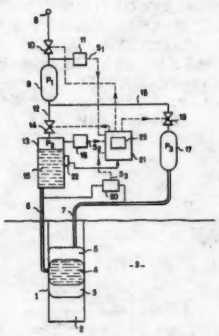
the spacing between the ridges being dimensioned to deflect the foil out of contact with said back electrode valley portions responsive to reducing said pressure below a second predetermined value.

4,598,591

APPARATUS FOR DETERMINING THE VARIATIONS IN VOLUME OF AN EXPANDABLE DEFORMABLE CELL EMBEDDED IN SOIL AND SUBJECTED TO INTERNAL PRESSURE GRADIENTS

Jean-Pierre Baud, Arpajon, France, assignor to Intra-Cofor, Paris, France

Filed May 16, 1984, Ser. No. 610,869
Claims priority, application France, May 17, 1983, 83 08181
Int. Cl.[4] G01N *3/10, 33/24*
U.S. Cl. 73—784 **5 Claims**



1. Apparatus for determining the variations in volume of a dilatable cell, this cell being filled with an incompressible fluid subjected to the pressure of a gas coming from a gas source and this cell being accompanied by one or more guard cells also subjected to gas pressure, the combination of the expandable cell and the guard cell or cells constituting a probe for embedding in soil of which the mechanical properties are to be determined, the said apparatus comprising:

a pre-expansion chamber to connect to the source of gas;

a gas line connecting the pre-expansion chamber to a pilot chamber where the pressure of the gas is exerted above a liquid adjoining the dilatable cell;

a gas line connecting the pre-expansion chamber to a buffer chamber connected to one or more guard cells;

a gas pressure sensor adapted to provide a signal S_1 representing the value of the pressure P_1 of the gas admitted into the pre-expansion chamber;

a solenoid valve adapted to control the admission of gas into the pre-expansion chamber;

a gas pressure sensor adapted to provide a signal S_2 representing the value of the pressure P_2 of gas in the pilot chamber;

a solenoid valve adapted to control the admission of gas into the pilot chamber;

means of detection adapted to provide a signal S_3 representing the pressure difference between the said pressure P_2 and the gas pressure P_3 in the guard cell or cells;

a solenoid valve adapted to control the admission of gas into the buffer cell and

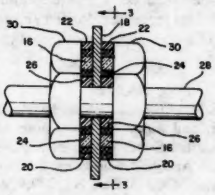
an electronic control unit which receives the signals S_1, S_2 and S_3 and which controls the operations of the solenoid valves in accordance with the predetermined program of the values of P_3 and of the desired relationships between P_3, P_2 and P_1, so as to implement this program and these relationships.

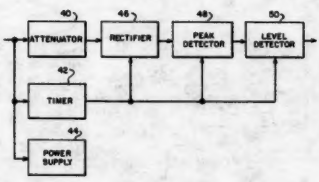
4,598,592

APPARATUS FOR DETERMINING THE FATIGUE CONDITION OF A STRUCTURE

Robert C. McMaster, Delaware, Ohio, assignor to JACA Corporation, Fort Washington, Pa.

Filed Oct. 31, 1983, Ser. No. 546,970
Int. Cl.[4] G01M 5/00
U.S. Cl. 73—786 31 Claims





28. Apparatus for determining the stress change history of a structure, said apparatus comprising:

a piezoelectric transducer adapted for attachment to a structure, responsive to stress changes in said structure caused by the application of loads to said structure for developing electrical signals representative of stress changes applied to said structure, and comprising a shaft adapted for attachment to said structure, a piezoelectric element surrounding and spaced from said shaft, an electrode in electrical contact with said piezoelectric element, and a pair of nuts engaging said shaft and retaining said piezoelectric element therebetween;

cirucuit means responsive to said electrical signals for processing said electrical signals to develop storage signals from said electrical signals; and

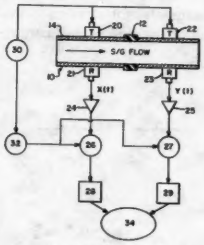
storage means responsive to said storage signals for storing said storage signals to develop a stress change history indication of the cumulative effect on said structure of loads applied to said structure.

4,598,593

ACOUSTIC CROSS-CORRELATION FLOWMETER FOR SOLID-GAS FLOW

Shuh-Haw Sheen, Naperville, and Apostolos C. Raptis, Downers Grove, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 14, 1984, Ser. No. 609,685
Int. Cl.[4] G01F 1/66, 1/70
U.S. Cl. 73—861.04 11 Claims



1. Apparatus for measuring particle velocity in a solid-gas flow within a pipe having a wall made of a material capable of propagating an ultrasonic signal therein comprising:

first and second transmitting transducers positioned at first and second locations, respectively, along the pipe, said first and second transmitting transducers being directly connected to the wall of said pipe to develop first and second ultrasonic signals in said pipe wall said first and second ultrasonic signals being modulated by noise from particle impingment;

an acoustic decoupler, positioned between said first and second transmitting transducers, for acoustically isolating said first and second modulated ultrasonic signals from one another;

first and second detecting transducers directly connected to the wall of said pipe for detecting said first and second modulated ultrasonic signals respectively and for generating first and second output signals respectively in response to said first and second detected modulated ultrasonic signals; and

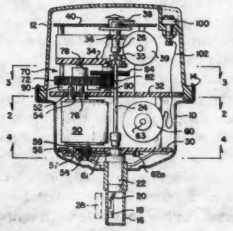
means for cross-correlating said first and second output signals.

4,598,594

PULSE GENERATOR

Elmer F. Painley, Uniontown, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 10, 1985, Ser. No. 732,536
Int. Cl.[4] G01F 15/06
U.S. Cl. 73—861.78 7 Claims



1. An impulse generator adapted to be driven by the flow responsive element of a fluid meter comprising: a rotatable armature, a drive shaft drive coupled to said flow responsive element, means for releaseably coupling said armature to said

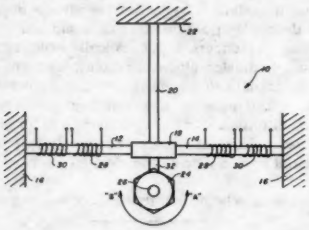
drive shaft comprising; a cam member rotatable about an axis parallel to the axis of said armature and having at least one cam surface extending inwardly from a point remote from the axis of rotation of said cam member and terminating at a point spaced from the axis of rotation of said cam member, means for driving said cam member from said drive shaft, a drive pin on said armature projecting into the path of movement of said cam surface, the axis of rotation of said armature being located at a point between the axis of rotation of said cam member and said drive pin when said drive pin is in its position of initial engagement with said cam surface, and biasing means resiliently biasing said armature for rotation in the direction opposite to the direction of rotation of said cam member.

4,598,595

TORQUE GAUGE FOR APPLICATIONS INCLUDING ROBOTICS

John M. Vranish, Crofton; Eugene Mitchell, Annapolis, and Robert DeMoyer, Arnold, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 18, 1985, Ser. No. 724,733
Int. Cl.[4] G01L *3/00*; G01B *7/24*
U.S. Cl. 73—862.08 **11 Claims**



1. Apparatus for measuring torque forces applied to a member comprising:

a pair of elongated magnetoelastic means portions having one of the ends along the length of each joined to each other with the other respective end being secured to a stationary member,

a torque transmission means connected between a rotatable member and the joined ends of the magnetoelastic means portions for transmitting torque forces applied to the rotatable member to the joined ends for applying tensile and compressive stress forces to the magnetoelastic means portions along the length, the tensile stress force and the compressive stress force changing the values of the magnetic characteristics of the respective magnetoelastic means portions,

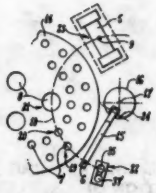
a first and second magnetic coupling means disposed in close proximity to each of the magnetoelastic means portions so that a magnetic field generatable by the first magnetic coupling means and penetrating the respective magnetoelastic means portions will cause changes in the generated magnetic field, the change of values of the generated magnetic field being detectable and measurable at the second magnetic coupling means for determining the amount of torque force applied to the rotatable member.

4,598,596

SAMPLE HANDLING METHOD AND APPARATUS

Alan G. Wiseman, Glen Waverley, and John T. Huberts, Mount Waverley, both of Australia, assignors to Varian Techtron Proprietary Limited, Mulgrave, Australia

Division of Ser. No. 405,445, Aug. 5, 1982, Pat. No. 4,517,850. This application Mar. 7, 1985, Ser. No. 709,250
Claims priority, application Australia, Aug. 5, 1981, PF0064
The portion of the term of this patent subsequent to May 21, 2002, has been disclaimed.
Int. Cl.[4] G01N *1/14, 35/06*; B01L *3/02*
U.S. Cl. 73—864.22 **9 Claims**



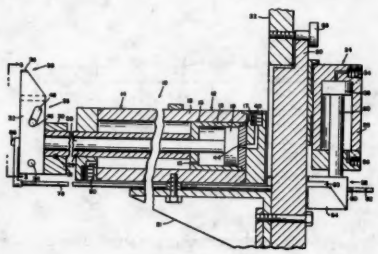
1. A sample handling method including the steps of, loading into a conduit in sequence a quantity of one ingredient of a solution mixture, a slug of separating fluid and a quantity of another ingredient of said mixture, and depositing said ingredients in last-in, first-out succession at a deposition zone in a single operation, the final ingredient loaded and first deposited being an ingredient of unknown compositional characteristics.

4,598,597

HAZARDOUS MATERIAL SAMPLING DEVICE

Rayburn K. Widner, and John M. Tate, both of Arab, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 4, 1985, Ser. No. 707,972
Int. Cl.[4] G01N *1/04*
U.S. Cl. 73—864.41 **8 Claims**



1. Apparatus for extracting samples of hazardous materials from an object comprising:

a. a source of gas pressure;

b. a first cylinder having a pair of pistons therein; the first of said pair of pistons being hollow and having a first hollow shaft extending therefrom, the second of said pair of pistons being concentrically mounted in said first piston and having a second shaft thereon, said second shaft extending through said first hollow shaft;

c. a cutter block assembly secured to the distal end of said first shaft,

d. a cutter assembly pivotably mounted on said cutter block assembly for cutting said hazardous material responsive to movement of said pistons to an extended position from said cylinder,

e. control means for directing said source of gas to said pistons for movement thereof to the extended position.

4,598,598

SERVO DRIVE

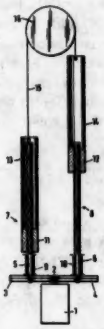
Werner Kring, and Karl Schleifenbaiim, both of Haiger, Fed. Rep. of Germany, assignors to Siegerland-Bremsen Emde GmbH, Haiger, Fed. Rep. of Germany

Filed Feb. 2, 1984, Ser. No. 576,156

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1983, 3304487

Int. Cl.[4] F16H *27/02, 29/02, 29/20*

U.S. Cl. 74—89.15 7 Claims



1. A setting drive for the accurate angular positioning of a shaft comprising an elongate flexible low-expansion tensioning member connected to said shaft for turning of said shaft free of slippage in response to lengthwise movement of said tensioning member, said tensioning member having a first spindle drive having a first part and a second part, means mounting said first part for turning movement but restrained against axial movement, the second part being connected to the first end of said tensioning member, said first and said second parts being drivingly connected so that turning movement of said first part moves said second part rectilinearly to move said tensioning member in a predetermined direction lengthwise of said tensioning member, a second spindle drive similar to said first spindle drive and having similar first and second parts, the second spindle drive first part being similarly mounted and the second part being connected to said second end of said tensioning member for lengthwise movement of said tensioning member, said first spindle drive and said second spindle drive being spaced apart laterally, a motor with an output shaft having a pinion thereon, and gear means interconnecting said pinion and the respective first parts for positively synchronously rotatably driving both of said spindle first parts synchronously to move both of said second parts rectilinearly in relatively opposite directions so that both of said second parts simultaneously and synchronously move said tensioning member in a predetermined direction lengthwise of itself.

4,598,599

DEVICE FOR PREVENTING REVERSE GEAR BUZZING IN A MANUAL TRANSMISSION

Kazuhito Ikemoto, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

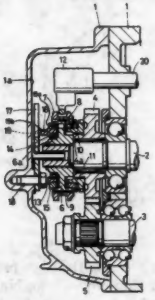
Filed Mar. 28, 1983, Ser. No. 479,498

Claims priority, application Japan, Sep. 30, 1982, 57-148136[U]

Int. Cl.[4] F16H *57/10, 3/38;* B60K *41/26;* F16D *11/00*

U.S. Cl. 74—411.5 8 Claims

1. In combination with a manual transmission provided with a synchromesh, mechanism and including a transmission casing, a shaft rotatably disposed in said transmission casing, a clutch hub mounted on said shaft and adapted to rotate synchronously with said shaft, said clutch hub having a spline on its outer circumference, a forward gear mounted on said shaft and adapted to rotate relative to said shaft, said forward gear being arranged on one side of said clutch hub, a hub sleeve engaged with the outer circumference of said clutch hub by a spline movable in the axial direction of said shaft, a synchronizing cone mounted on a boss portion formed on a side of said forward gear adjacent said one side of said clutch hub and adapted to rotate synchronously with said forward gear, said synchronizing cone having a spline with which said hub sleeve is engaged and a frusto-conical surface converging toward said clutch hub, a synchronizer ring adapted to be fitted on the conical surface of said synchronizing cone during synchronizing operation, an index member provided at said hub sleeve and adapted to be moved with said hub sleeve for bringing the spline of said hub sleeve into opposed relation with a spline of said synchroniziner ring, wherein upon forward shifting operation, said hub sleeve is engaged with said clutch hub and said synchronizing cone, and said forward gear rotates synchronously with said shaft, and upon reverse shifting operation, said hub sleeve is idly moved in an opposite direction to that in the forward shifting operation; a device for preventing reverse



gear buzzing comprising an irrotational cone supported on said shaft in coaxial relation thereto on an opposite side of said clutch hub and adapted to rotate relative to said shaft, said irrotational cone having a frusto-conical surface on its outer periphery diverging in a direction opposite to said clutch hub, abutment means for limiting and stopping rotation of said irrotational cone and permitting said irrotational cone to move radially, said abutment means including at least one stopper located on the irrotational cone and at least one engaging member located on an inner surface of said transmission casing and projecting toward said stopper on said irrotational cone for abuttedly engaging with said stopper to permit limited relative rotation between the stopper on the irrotational cone and the engaging member on the transmission casing, and a friction ring coaxial with said shaft and adapted to be fitted on the conical surface of said irrotational cone, wherein upon reverse shifting operation, said friction ring is urged rearwardly by said index member to press against the outer circumference of said irrotational cone.

4,598,600

BEARING SUPPORT STRUCTURE

William C. Knowles, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 5, 1983, Ser. No. 558,400

Int. Cl.[4] F16H *1/14;* F02C *7/20*

U.S. Cl. 74—423 8 Claims

1. A bearing support structure for a low pressure shaft for a fan engine including:

an intermediate case having an inner wall structure with a support flange extencing inwardly therefrom near the rearward end and support struts extending outwardly from the wall structure in the same transverse plane as the support flange,

a support cone attached to said flange and extending for-

wardly therefrom, a low pressure shaft supported within the cone, said cone having an axis coinciding with the axis of the shift, a bearing supported at the forward end of the cone for the low pressure shaft,

a cylinder mounted in said cone between its ends and extending outwardly therefrom,

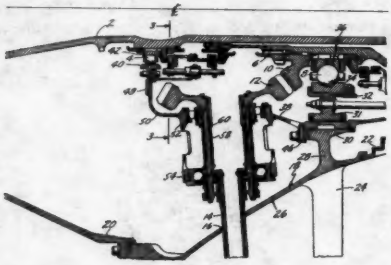
bearings in said cylinder and

a power drive shaft supported in said bearings.

6. A bearing support structure for a low pressure shaft of a fan engine including:

an intermediate case having an inner wall structure with a support flange extending inwardly therefrom near the rearward end and support struts extending outwardly from the wall structure in same transverse plane as the support flanges,

a high pressure shaft supported in the case,



a low pressure shaft within the high pressure shaft and having an end extending beyond the high pressure shaft,

a bearing supported radially inwardly of said support flange and substantially in the same plane as said flange for the high pressure shaft,

a support cone attached to said flange and extending forward and having a buldge thereon between its ends, therefrom,

a bearing supported at the forward end of the cone for the low pressure shaft,

a cylinder mounted in the buldge on said cone between its ends and extending outwardly therefrom substantially at right angles to the shafts,

bearings in said cylinder and

a power drive shaft supported in said bearings.

4,598,601

MEANS FOR COUNTERBALANCING MASS IN MECHANISMS SUCH AS A ROBOT ARM

Ole Molaug, Jernbanegaten 4, N-4340 Byrne, Norway

Filed Sep. 15, 1983, Ser. No. 532,538

Claims priority, application Norway, Sep. 17, 1982, 823150

Int. Cl.[4] G05G *1/00*

U.S. Cl. 74—469 **2 Claims**

1. A means for counterbalancing the weight of a tool and the weight of mass in mechanisms such as a robot arm (1), wherein the robot arm (1) has a fixed support point (2) and is attached to a spring (3) for counterbalancing a load on the arm, said spring (3) being fastened to the arm via a spring tensioning means (4), characterized in that the point of attachment (6) for the other end of the spring (3), remote from the arm (1), is arranged along a first straight line through the fixed support point (2) for the arm (1) and the spring (3) is aligned along a second straight line different from said first straight line, through the point of attachment (6) to the robot arm (1), and including means for moving the point of attachment (6) along the first straight line, so that the distance between said remote point of attachment (6) for the spring (3) and the fixed support point (2) for the robot arm (1) can be varied along the first straight line between the two points (6, 2) and simultaneously the direction of the second straight line can be varied between the point of attachment (6) and the robot arm (1) for altering the geometry of the system, according to the weight of the mass and the weight of the tool (9), attached to the robot arm (1), whereby the robot arm (1) is counterbalanced in all positions and can be adjusted to different weights without reducing the dynamic properties of the robot arm (1).

4,598,602

STEERING SYSTEM EQUIPPED WITH STEERING WHEEL CENTER PAD ANTI-ROTATION MECHANISM

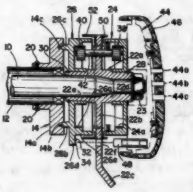
Hidenori Kurata, Zama, and Michiyoshi Takahara, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Sep. 19, 1984, Ser. No. 652,248

Claims priority, application Japan, Oct. 11, 1983, 58-189610

Int. Cl.[4] B62D *1/04, 1/16*

U.S. Cl. 74—484 R **2 Claims**



1. A steering system, comprising:

a stationary column having an upper end portion;

a steering shaft concentrically surrounded by said column and having an upper end portion projecting from the upper end portion of said column;

a steering wheel having a hub portion at which it is mounted on the upper end portion of said steering shaft for rotation therewith;

said hub portion being formed to have an annular flange section and coaxial upper and lower sleeve sections projecting upwardly and downwardly, respectively, from the inner periphery of said flange section;

a pair of upper and lower internal gears, rotatably mounted on said upper and lower sleeve sections respectively;

pinion means rotatably mounted on said hub portion for meshing with said upper and lower internal gears to drivingly interconnect the same; and

means for preventing rotation of said lower internal gear relative to said column, said preventing means including an anchor leg provided to said lower internal gear and an annular member fixedly attached to the upper end of said stationary column and formed with a hole in which said anchor leg is fitted;

in which said annular member comprises a casing of a combination switch.

4,598,603

STEERING WHEEL

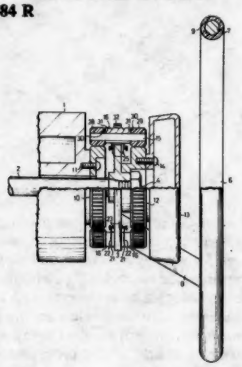
Tetsushi Hiramitsu; Hiroshi Sugita, and Satoshi Ono, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Aug. 28, 1984, Ser. No. 645,155

Claims priority, application Japan, Aug. 29, 1983, 58-133349 [U]; Sep. 12, 1983, 58-141264 [U]; Sep. 17, 1983, 58-144061[U]

Int. Cl.[4] B62D *1/10, 1/16*

U.S. Cl. 74—484 R 13 Claims



1. A steering wheel comprising:
(a) a steering shaft;
(b) column and pad sun gears mounted on said steering shaft for rotation relative thereto;
(c) a boss plate mounted on said steering shaft between said sun gears and rotatable in unison with said steering shaft;
(d) at least one bearing mounted on said boss plate and movable toward and away from a center of said boss plate;
(e) a planet shaft rotatably supported by said bearing; and
(f) column and pad planet gears mounted on opposite ends of said planet shaft and held in mesh with said column and pad sun gears, respectively, said planet gears having inner side surfaces rotatably held in contact with opposite outer side surfaces of said bearing.

4,598,604

STEERING DEVICE FOR MOTOR VEHICLES, ADJUSTABLE ALONG ITS LONGITUDINAL AXIS

Joachim H. Sorsche, Stuttgart-Schoenberg, and Karl Peitsmeier, Neuhausen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

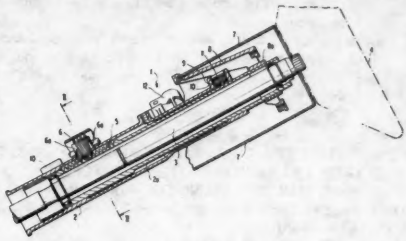
Filed May 21, 1984, Ser. No. 612,556

Claims priority, application Fed. Rep. of Germany, May 25, 1983, 3318935

Int. Cl.[4] B62D *1/18*

U.S. Cl. 74—493 8 Claims

1. A steering device for motor vehicles, adjustable along its longitudinal axis and with a steering column telescopically extendable and retractable in response to a drive device, and switch means for controlling direction of telescopic movement wherein a steering column jacket comprises at least two parts, a first of the steering column jacket parts being fixed to a vehicle body and at least a second of the steering column jacket parts has an axis which is co-axial and at least substantially concentric with the first and being moveable relative to the first steering column jacket fixed part and guided axially by the first part, at least one upper part of a steering spindle carrying a steering wheel being rotatably supported and secured against axial displacement in the second steering column jacket moveable part, coupling means for introducing adjustment movement into the steering column jacket moveable part and wherein the coupling means comprises a toothed rack located on just one side of a periphery of a lower half the steering column jacket moveable part and a worm gear driven by a drive motor located with the worm gear having an axis parallel to and spaced from the axis of the steering column jacket moveable part directly engaging the toothed rack through a



recess in the steering column jacket fixed part, the engagement angle of the worm gear with the toothed rack dimensioned to preclude introduction to rotary momentum into the worm gear during substantial axial load on the rack.

4,598,605

MECHANISM WITH TORQUE-LIMITING DEVICE FOR CONTROLLING A REARVIEW-MIRROR

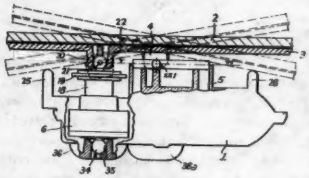
Stéphane Manzoni, Saint-Claude, France, assignor to Manzoni Bouchot, France

Filed May 5, 1983, Ser. No. 491,633

Claims priority, application France, May 13, 1982, 82 08347

Int. Cl.[4] F16C *1/10*

U.S. Cl. 74—501 M 11 Claims



1. A torque-limiting mechanism for operating a rearview mirror of a vehicle, said torque-limiting mechanism comprising:
a casing having a cavity therein;
a cover member mounted to said casing, said cover member having at least one opening therein;
a support member attached to said mirror, said support member further being spaced a predetermined distance from said cover member of said casing;
universal pivot joint means interposed said support member and said cover member of said casing, said universal pivot joint means adapted to allow pivoting movement of said mirror about at least one axis;
rotation to translation means mounted in said cavity of said casing, said rotation to translation means comprising:
at least one pinion gear member mounted in said cavity of said casing;
at least one selectively movable control member having a central axis and being mounted to said at least one pinion gear member for movement relative thereto, said at least one selectively movable control member further having one end portion and an opposite end portion:
second pivot joint means located at said one end portion of said at least one selectively movable control member, said second pivot joint means adapted to cooperate with said support member for pivot motion of said support member relative to said at least one selectively movable control member;

a first spherical ball joint member means adjoining said at least one pinion gear member, said first spherical ball joint member means being defined by a spherical radius having a center of curvature lying substantially along said central axis of said at least one selectively movable control member; and

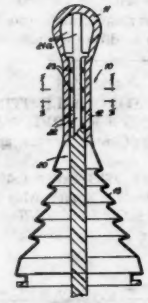
motor means mounted in said casing at a preselected location relative to said at least one pinion gear member and adapted to rotate said at least one pinion gear member.

4,598,606

CONTROL LEVER, IN PARTICULAR A GEARSHIFT CONTROL LEVER FOR MOTOR VEHICLES, AND METHOD FOR THE MANUFACTURE THEREOF

Giovanni Foggini, Turin, Italy, assignor to Lear S.n.c. di Foggini & C., Orbassano, Italy

Filed Dec. 15, 1982, Ser. No. 449,939
Claims priority, application Italy, Dec. 21, 1981, 68651 A/81
Int. Cl.[4] G05G *1/04*
U.S. Cl. 74—523 6 Claims



1. A control lever for motorvehicles, comprising a rod at least in part of non metallic construction, said rod having a ribbed profile thereby to increase its bending strength, said rod having an upper end portion, a lower end portion for connection with a swivel joint and an intermediate portion joining said upper and said lower end portion, said ribbed profile widening out at said upper end portion to define a knob formation, a cover structure surrounding said rod, said cover structure having a first section surrounding said upper portion of said rod and said knob formation thereof and at least part of said intermediate portion thereof and in close contact and in anchoring relationship with said ribbed profile, said cover structure having further a second bellows-like section surrounding at a distance therefrom said lower end portion and at least part of said intermediate portion, said second bellows-like section of said cover structure being an integral part of said first cover section.

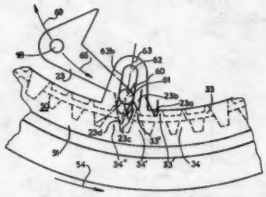
5. A gearshift lever for motorvehicles, comprising a rod at least in part of polymeric material, said rod having a ribbed profile thereby to increase its bending strength, said rod having an upper end portion, a lower end portion for connection with a swivel joint and an intermediate portion joining said upper and said lower end portion, said ribbed profile widening out at said upper end portion to define a knob formation, a cover structure surrounding said rod, said cover structure having a first section surrounding said upper portion of said rod and said knob formation thereof and at least part of said intermediate portion thereof and in close contact and in anchoring relationship with said ribbed profile, said cover structure having further a second bellows-like section surrounding at a distance therefrom said lower end portion and at least part of said intermediate portion, said second bellows-like section of said cover structure being an integral part of said first cover section and wherein said rod and said cover structure are in co-molded relationship with each other.

4,598,607

PROGRAMMER CONTROL DEVICE

Jean Monie, Cluses, France, assignor to Carpano et Pons, France

Filed Jan. 22, 1985, Ser. No. 693,650
Claims priority, application France, Feb. 3, 1984, 84 02241
Int. Cl.[4] F16H *53/00*
U.S. Cl. 74—568 T 6 Claims



1. A programmer control device comprising a programme-cam unit and a reversing cam unit disposed coaxially, adapted to be each driven for step by step rotation by means of at least a plurality of spring-loaded rocking pawls, the beak of each rocking pawl being adapted to cooperate with a toothed movable member kinematically connected to the corresponding cam unit, an automatic control element being adapted to control the step by step rotation of said programme-cam unit at a fast rate, wherein the beak of the pawl driving said reversing cam unit is kinematically connected via a lost-motion sliding coupling device to a movable deceleration element comprising a first portion of which the backward path, at the end of each forward movement of the pivoting pawl and deceleration element is adapted to be intersected by an automatic control element when simultaneously the step by step feed of said programme-cam unit is controlled at a fast rate, said lost-motion sliding coupling device consisting of a stud supported laterally by said pawl beak or said deceleration element and adapted to slide in an elongated slot formed in said deceleration element or said pawl beak, respectively, said elongated slot extending across the path of said deceleration element at the level of said pawl beak, in a direction such that on the one hand when the pawl beak drops behind each tooth of the corresponding toothed movable member, the path of said beak is inclined in relation to the longitudinal axis of said slot, whereby said stud and one longitudinal side of said slot are in mutual sliding contact and carry along said deceleration element backwards, and such that, on the other hand, after said deceleration element has been locked by said automatic control element, when said pawl pivots backwards, the path followed by the oscillating pawl is inclined in relation to the longitudinal axis of said slot and produces a relative sliding movement between said stud and said slot in a direction causing the pawl beak to move away from the teeth of the corresponding movable toothed member.

4,598,608

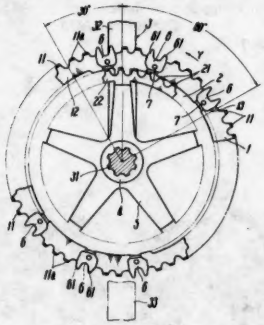
GEAR CRANK FOR A BICYCLE

Tadashi Ueno, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Feb. 5, 1981, Ser. No. 231,855
Claims priority, application Japan, Feb. 13, 1980, 55-17289[U]
Int. Cl.[4] G05G *1/14;* F16H *55/12, 55/06*
U.S. Cl. 74—594.2 6 Claims

1. A gear crank for a bicycle, comprising a plurality of chain gears each having a body formed of a lightweight material, and a large number of teeth, said gears having different diameters; a crank shaft supporting said chain gears; and a crank means including a pair of crank arms, one of said gears being a larger diameter chain gear which has predetermined peripheral teeth formed of a more rigid material than the material of the body of said larger diameter chain gear and the remaining teeth of said larger diameter chain gear, said predetermined teeth being

positioned within a range including a 30° sector angle of said larger diameter chain gear in a forward driving rotation direction from each of said crank arms, and a 60° sector angle of said larger diameter chain gear rearward in the same direction from each of said crank arms, said sector angles lying at both cir-



cumferential sides of said larger diameter chain gear, said crank arms lying within said range, said predetermined teeth being formed as easy engagement teeth for easily engaging with a driving chain as compared with the remaining teeth of said larger diameter chain gear.

4,598,609

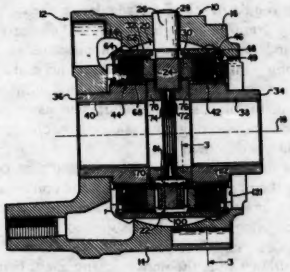
POSITIVE DRIVE

Richard A. Neilums, Union Lake; Eugene R. Braun, Royal Oak, and Joseph C. Holtzhauser, Kalamazoo, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 23, 1984, Ser. No. 602,995

Int. Cl.⁴ F16H *35/04*

U.S. Cl. 74—650 **5 Claims**



1. An improved positive drive of the type including a housing, a drive cam rotationally fixed to the housing, first and second output coupling members adapted to drive first and second shafts, first and second clutch means associated with said first and second output coupling members, each of said clutch means having a disengaged mode which allows its respective output coupling member to rotate relative to said drive cam member and an engaged mode which maintains a predetermined rotational relationship between said respective output coupling member and said drive cam member, first and second clutch cams having cam follower ramp surfaces for interaction with cam surfaces provided on said drive cam, said first and second clutch cams effective to engage and disengage said first and second clutch means, respectively, and balking means associated with said first and second clutch cam to limit the relative rotational displacement therebeteween, said positive drive characterized by;

a first and a second generally tubular clutch sleeve associated with said first and second clutch means and clutch cams, respectively, each of said clutch sleeves defining mounting means for engagement with its respective clutch cam to rotationally couple said sleeve and clutch cam, said mounting means comprising internal splines formed in said clutch sleeves for engagement with external splines formed on said clutch cams, said first and second clutch means each comprising a friction clutch pack comprising a set of first clutch discs having external splines formed on the radially outer peripheral thereof for splined connection with said internal splines carried by said clutch sleeve, said first clutch discs interleaved with second clutch discs rotationally fixed to said output couplings, at least one of said first and second clutch sleeves defining a plurality of balking teeth extending toward the other of said clutch sleeves for interengagement with balking teeth provided in the other of said first and second clutch sleeves to limit the rotational freedom between said first and second clutch cams, said balking teeth defined by integral axially extending portions of said tubular clutch sleeves and located radially outwardly of said cam follower ramp surfaces and said cam surfaces.

4,598,610

AUTOMATIC STEPLESS TRANSMISSION EQUIPMENT

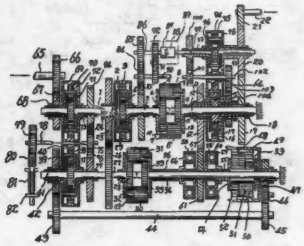
Young I. Kim, 103, Jae Won Apartment Ka Dong, 318-4, Kye San-Dong, Buk-Ku In Chun-City, Kyung Ki-do, Rep. of Korea

Filed Apr. 6, 1983, Ser. No. 482,607

Claims priority, application Rep. of Korea, Apr. 10, 1982, 1982/1578

Int. Cl.⁴ F16H *37/06, 3/74*

U.S. Cl. 74—682 **6 Claims**



1. An automatic stepless transmission comprising:

a high speed gear system having a distribution gear train wherein an input to said high speed gear system is distributed by said distribution gear train to a high speed counter gear train having an output driving a junction gear train, wherein an output of said high speed gear system is produced through said distribution gear train to said high speed counter gear train and from said high speed counter gear train to said junction gear train;

a first low speed gear system operatively connected to said distribution gear train and having an output driving an outer counter gear train and a spring type high and low adjustment gear train having an output operatively connected to a junction gear train directly connected to the output;

a second low speed gear system operatively connected to said distribution gear train and having an output driving an auxiliary adjustment gear train having an output driving an inner counter gear train, the spring type high and low speed adjustment gear train and the junction gear train which is directly connected to the output;

an input of said first and second low speed gear systems being distributed by said distribution gear train;

an output of said first and second low speed gear systems being produced through said distribution gear train said spring type high and low adjustment gear train and the junction gear train via said low speed outer counter gear train or said auxiliary adjustment gear train and said inner counter gear train;

a neutral clutch train;

a neutral gear train operatively positioned at the output of said high and low speed gear systems;

a main adjustment gear train operatively connected to a sensitive adjustment gear train;

wherein the load on the output in said high and first and second low speed gear systems is selectively regulated by said main adjustment gear train and auxiliary gear train depending on speed changes.

4,598,611

LOW POWER CONTROL SYSTEM AND METHOD FOR A POWER DELIVERY SYSTEM HAVING A CONTINUOUSLY VARIABLE RATIO TRANSMISSION

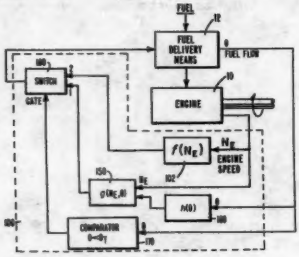
Andrew A. Frank, Madison, Wis., assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation-in-part of Ser. No. 380,922, May 21, 1982, Pat. No. 4,459,878. This application May 29, 1984, Ser. No. 614,755

The portion of the term of this patent subsequent to Jul. 17, 2001, has been disclaimed.

Int. Cl.[4] B60K *41/18, 41/12*

U.S. Cl. 74—860 **104 Claims**



1. A method of controlling the low power operation of a power delivery system including a prime mover and a continuously variable ratio transmission coupled to the prime mover for delivering power from the prime mover to an output shaft, the prime mover having fuel delivery means for delivering a variable quantity of fuel thereto, the method comprising the steps of:

measuring the speed of the prime mover;

predetermining a fuel function defining desired fuel requirements for the prime mover in relation to at least prime mover operating speed, said fuel function prescribing an increased fuel flow for a decrease in measured operating speed and a reduced fuel flow for an increase in measured operating speed;

controlling the fuel delivery means only in accordance with said fuel function, whereby the speed of the prime mover is regulated in accordance with the load placed thereon; and

commanding desired performance of the power delivery system by reducing the transmission ratio to command an increase in power output and increasing the transmission ratio to command a reduction in power output.

4,598,612

PUMP CONTROL ARRANGEMENT FOR AUTOMATIC AUTOMOTIVE TRANSMISSION OR THE LIKE

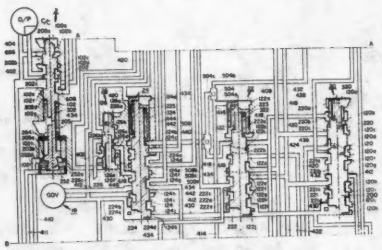
Yasufumi Ideta, Sagamihara, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 21, 1984, Ser. No. 591,849

Claims priority, application Japan, Apr. 1, 1983, 58-57258

Int. Cl.[4] B60K *41/16*

U.S. Cl. 74—867 **4 Claims**



1. In a transmission, having a torque converter

a hydraulic control circuit for controlling the transmission comprising:

a variable capacity pump for supplying fluid under pressure, said pump having a control arrangement including a control chamber, said control arrangement varying the capacity of said pump in response to the pressure prevailing in said control chamber;

a pressure regulator valve for regulating the output of said pump by draining off some of the fluid discharged by said pump and developing a control pressure, said pressure regulating pump having first and second drain ports, said first drain port fluidly communicating with said torque converter through a first conduit, said second drain port fluidly communicating with said control chamber through a second conduit; and

a pressure limiting valve disposed in said first conduit for limiting the pressure fed to said torque converter through said first conduit, said pressure limiting valve having a feedback chamber which is supplied with the pressure prevailing in said first conduit downstream of said pressure limiting valve, the above arrangement being such as to maintain the pressure in said control chamber at a level which minimizes the power consumption of said pump with respect to the level of control pressure produced by said regulator valve

wherein said pressure limiting valve comprises:

a spool reciprocatively disposed in a bore,

said bore including a variable volume feedback chamber defined therein by said spool, an inlet port which communicates with said first drain port, an outlet port which communicates with said torque converter, a drain port and a feedback port which is in fluid communication with said feedback chamber and said outlet port via a flow restriction,

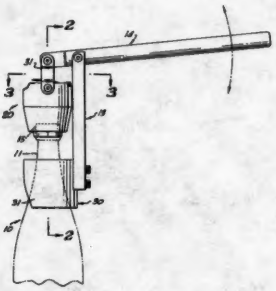
said spool being arranged to control the communication between said inlet and drain ports so as to control the pressure prevailing at said outlet port in response to the pressure prevailing in said feedback chamber.

4,598,613

CHAMPAGNE BOTTLE OPENER

Frederick W. Baum, 22710 Oxnard St., Woodland Hills, Calif. 91361

Filed Jul. 29, 1985, Ser. No. 759,950
Int. Cl.[4] B67B 7/32
U.S. Cl. 81—3.37 23 Claims



1. A device for removing a stopper protruding upwardly from a bottle comprising:

brace means selectively securable to the bottle at a location beneath the stopper;

chuck means having a plurality of opposing, radially-moveable jaws encircling the stopper and a collar encircling the jaws such that vertical movement of the collar relative to the jaws urges the jaws radially inwardly to engage the bottle stopper; and

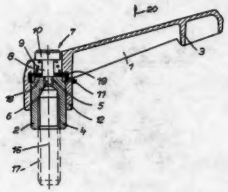
actuator means operatively connected to the brace means and chuck means for raising the chuck means relative to the brace means and thereby removing the stopper from the bottle.

4,598,614

HAND LEVER TURNING MECHANISM

Heinrich Kipp, Sulz-Holzhausen, Fed. Rep. of Germany, assignor to Heinrich Kipp Werk, Sulz, Fed. Rep. of Germany

Filed Dec. 26, 1984, Ser. No. 686,223
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1983, 3347433
Int. Cl.[4] B25B 13/06
U.S. Cl. 81—58.3 1 Claim



1. A hand lever mechanism, particularly for turning a member, such as a spindle, axle or the like about an axis, comprising:

a fastening element made of metal adapted to be placed in engagement with a member to be turned;

a hand lever made of synthetic material softer than said fastening element material;

a coupling element formed with an annular configuration consisting essentially of a metallic pressure die cast member having one side affixed to said hand lever and an opposite side engaging said fastening element to connect said fastening element and said hand lever in rotative engagement with each other, the material of said coupling element being selected to be harder than the material of said hand lever, whereby said coupling element is anchored in the material of said hand lever and is rotatable therewith;

coupling members formed on said opposite side of said coupling element and distributed along the periphery thereof, said coupling members being formed on said opposite side of said coupling element facing said fastening element and comprising gear teeth formed as a toothed rim with said gear teeth facing radially inwardly;

anchoring elements comprising projecting elements arranged uniformly along an outer periphery of said coupling element for anchoring said coupling element in the material of said hand lever;

a complementary coupling element formed on said fastening element engaging said coupling members of said coupling element, said complementary coupling element being formed as a pinion having gear teeth radially outwardly directed and shaped to engage with said teeth of said toothed rim of said coupling element, said coupling element and said complementary coupling element being capable of engaging and disengaging by relative movement thereof in the direction of said axis;

spring means acting in the direction of said axis urging said coupling element and said complementary coupling element into rotative engagement with each other; and

a screw member threadedly engaged in said fastening element and extending through said coupling element with said spring means being engaged between said screw member and said coupling element;

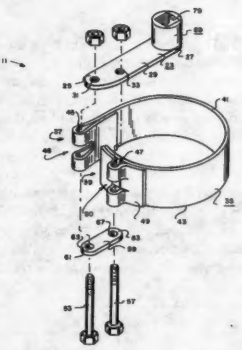
said fastening element being in the form of a sleeve with said hand lever being formed with an end thereof having a sleeve-like configuration, said fastening element being arranged longitudinally displaceable within said sleeve-like configuration of said one end of said hand lever.

4,598,615

ADJUSTABLE WRENCH

Bernell G. Tate, Rte. 6, Box 237B, Tupelo, Miss. 38801

Filed Jan. 11, 1985, Ser. No. 690,945
Int. Cl.[4] B25B 13/52
U.S. Cl. 81—64 9 Claims



1. An adjustable wrench for use with an auxiliary tool having a head portion and having an elongated neck portion extending from said head portion to rotate a screw-on type filter having a first end for being screwed onto a support portion of an internal combustion engine, having a second end directed away from said support portion, and having a longitudinal axis extending between said first and second ends, rotation of said filter about said longitudinal axis being effective to screw said first end thereof onto or off of said support portion, said wrench comprising:

(a) an elongated lever having a first end, a second end, and

an intermediate portion between said first and second ends;

(b) an elongated, flexible body defining a circle for encircling said second end of said filter, said body having a first end attached to said first end of said lever and having a second end attached to said intermediate portion of said lever, said lever being movable between a first position in which said second end of said lever is located a spaced distance from the center of said circle defined by said body and a second position in which said second end of said lever is located substantially at the center of said circle defined by said body, said body tightly engaging said filter when said lever is in said second position; and

(c) activating means attached to said second end of said lever for use in moving said lever between said first and second positions, said activating means having a longitudinal axis, said longitudinal axis of said activating means being substantially aligned with said longitudinal axis of said filter when said lever is in said second position, rotation of said activating means about said longitudinal axis thereof when said lever is in said second position causing said filter to rotate about said longitudinal axis thereof, said activating means having a socket for receiving said head portion of said auxiliary tool substantially aligned with said longitudinal axis of said activating means.

4,598,616

WRENCH OPENING

David S. Colvin, 23933 Haynes, Farmington Hills, Mich. 48018

Filed Sep. 18, 1985, Ser. No. 777,237

Int. Cl.[4] B25B *13/06*

U.S. Cl. 81—124.6 17 Claims

1. A wrench body including a wrench opening having a central axis, said wrench opening comprising: a plurality of engagement surfaces defining a closed shape and facing inwardly toward the central axis, each of said engagement surfaces having an inwardly convex shape and including opposite end portions that are continuously curved with the same curvature as each other, the engagement surfaces having curvatures including central portions spaced from the central axis by a radius R_1, the curvature of each engagement surface having a radius R_2, and R_1 being in the range of about 0.06 R_2 to 0.40 R_2 whereby the wrench opening provides greater surface-to-surface engagement with nuts or bolt heads to be torqued than is possible with engagement surfaces having flat surface portions.

4,598,617

TOOL HOLDER ASSEMBLY HAVING CUTTING FLUID SUPPLY CIRCUIT

Haruaki Kubo, and Yoshiyuki Kamanaka, both of Nara, Japan, assignors to Daishowa Seiki Co., Ltd., Osaka, Japan

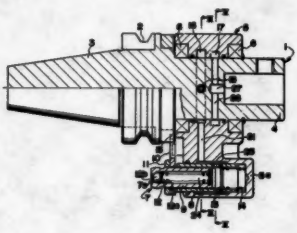
Filed Nov. 15, 1984, Ser. No. 671,512

Claims priority, application Japan, Dec. 7, 1983, 58-189632[U]

Int. Cl.[4] B23B *51/06*

U.S. Cl. 82—36 R 4 Claims

1. A tool holder assembly which comprises, in combination, a tool holder connected to a spindle of a machine for rotation together therewith, a stationary support member rotatably coupled to said tool holder for rotatably supporting the tool holder connected to a fixed portion of the machine, a fluid supply circuit defined in the tool holder for supplying a cutting fluid from an external source thereof towards a fluid discharge passage defined in a cutting tool, said cutting tool being replaceably connected to and carried by the tool holder, and a vane-type displacement pump assembly coupled to said fluid supply circuit comprising a rotor, constituted by a portion of the tool holder, and a pump casing constituted by a portion of



the stationary support member, said rotor further having first and second cylindrical portions with said first cylindrical portion being smaller in diameter than said second cylindrical portion and with said second cylindrical portion having at least one vane projecting therefrom, said vane-type displacement assembly being operable to forcibly pump the cutting fluid, which has been supplied from the external source thereof to the vane-type displace-ment pump, towards the fluid discharge passage in the cutting tool.

4,598,618

FOOD-SLICING MACHINE AND METHOD

Fritz Kuchler, Klagenfurt, Austria, assignor to Brain Dust Patents Establishment, Vaduz, Liechtenstein

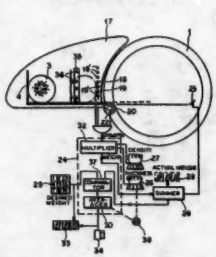
Division of Ser. No. 415,398, Sep. 7, 1981, abandoned, which is a continuation of Ser. No. 143,929, Apr. 24, 1980, Pat. No. 4,379,416, which is a continuation-in-part of Ser. No. 911,289, May 31, 1978, Pat. No.

Claims priority, application Austria, Jun. 1, 1977, 3858/77; Jun. 1, 1977, 3859/77; Sep. 13, 1978, 6603/78

The portion of the term of this patent subsequent to Aug. 12, 1997, has been disclaimed.

Int. Cl.[4] B26D *7/30, 7/32*

U.S. Cl. 83—77 2 Claims



1. A slicing machine comprising:

a blade;

a foodstuff support adapted to support an elongated foodstuff and displaceable in a slicing direction past said blade to cut a slice from said foodstuff;

weight-estimating means connected to said support and including a means for measuring the surface area of the slice being cut in the form of a vertical row of photocells for generating an output proportional to the weight of the

slice cut from said foodstuff as said support is displaced past said blade;

input means for generating an output corresponding to a desired weight; and

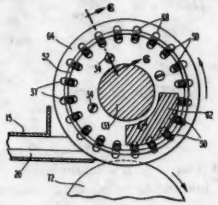
signal means connected to said weight-estimating and input means for producing a signal when the overall weight of the given succession of slices corresponds to said desired weight.

4,598,619

CUTTER AND EJECTOR FOR USE IN MANUFACTURE OF LICORICE BITES

Lloyd C. Leeper, Harrisburg, and C. Thomas Mullen, Hummelstown, both of Pa., assignors to Hershey Foods Corporation, Hershey, Pa.

Filed Apr. 15, 1985, Ser. No. 723,094
Int. Cl.[4] B26D *1/62, 7/18*
U.S. Cl. 83—117 **9 Claims**



1. For use in licorice manufacturing equipment in which extruded licorice strips are to be reduced to bite length:

a. a cylindrical roller mounted for rotation about its axis, said roller carrying a circular series of elongated knife blades projecting from said roller along radial lines and at equal angular spacings, the cuttin edge of each knife blade parallel to the rotational axis of said roller;

b. a circular series of elongated ejector rods positioned parallel to and between said knife blades;

c. a pair of end plates, one at each end of said roller, mounted concentrically with said roller for rotation therewith, each end plate being provided with radial slots receiving and supporting opposite ends of the said ejector rods, and allowing movement of said rods in said slots in the radial directions;

d. resilient retaining means embracing said circular series of rods at opposite ends of said rods for retaining said rods in said slots on a circular diameter smaller than that defined by the outer ends of the series of slots; and

e. a pair of camming surfaces one at each end of said knife-carrying roller and so positioned that, during rotation of said roller and end plates, said ejector rods come into engagement with said camming surfaces and are cammed radially outwardly, thereby to dislodge licorice bites from between adjacent cutting knives.

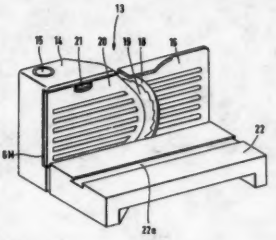
4,598,620

HOUSEHOLD APPLIANCE WITH AN ADJUSTABLE GUARD FOR A ROTARY TOOL

Norbert Flammann, Solingen, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG, Solingen, Fed. Rep. of Germany

Filed Oct. 26, 1984, Ser. No. 665,128
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1983, 3341168
Int. Cl.[4] B26D *7/22*
U.S. Cl. 83—399 **20 Claims**

1. An appliance, such as a household slicing machine, comprising a support; a tool movably mounted in said support; a protective guard for said tool, said guard being mounted on said support and being movable relative to said support between a first position in which it prevents access to said tool and a second position in which said tool is at least partly exposed; actuating means for initiating the movement of said tool relative to said support, said actuating means being movable



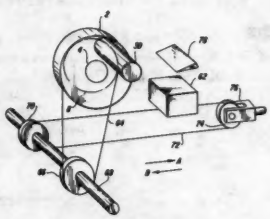
between an operative and an inoperative position; and means for blocking the movement of said actuating means from said inoperative position to said operative position in response to movement of said guard to said first position.

4,598,621

MICROTOME HAVING A HANDWHEEL FOR DRIVING A SPECIMEN HOLDER

Helmut Weinhold, Ketsch, Fed. Rep. of Germany, assignor to Parke, Davis & Company, Morris Plains, N.J.

Filed Feb. 28, 1985, Ser. No. 706,827
Int. Cl.[4] G01N *1/06*
U.S. Cl. 83—731 **17 Claims**



1. A microtome comprising:

a cutting knife,

a specimen holder movable relative to the cutting knife in first and second directions,

a handwheel rotatable in opposite directions of rotation,

drive means adapted to move the specimen holder in the first direction in response to rotation of the handwheel in one direction, and to move the specimen holder in the second direction in response to rotation of the handwheel in the other direction,

and transmission means adapted to provide a ratio of the rate of movement of the specimen holder in the first direction to the rate of rotation of the handwheel, which is less than the ratio of the rate of movement of the specimen holder in the second direction to the rate of rotation of the handwheel.

4,598,622

COMBUSTION INHIBITING CONSTRUCTION OF A WELT CORD

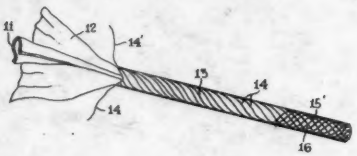
E. L. Briggs, P.O. Box 2436, High Point, N.C. 27261

Filed Aug. 2, 1982, Ser. No. 404,018
Int. Cl.[4] D04C *1/02, 1/06;* A47C *27/12;* D02G *3/12*
U.S. Cl. 87—6 **4 Claims**

1. In upholstered furniture having a welt comprising a welt

cord covered by at least a single thickness of a fabric, an improved welt cord construction for inhibiting the spread of combustion in said fabric when exposed to a source of combustion; wherein, the improved welt cord construction consists of:

a welt cord body comprising an elongated thin strip of metal



foil which forms at least a portion of the core of said welt cord body;

an elongated thin sheet of paper encompassing the core of said welt cord body; and

at least one metallic thread spirally wound around the said sheet of paper and the core of said welt cord body.

4,598,623

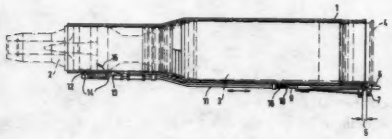
AMMUNITION-STOWAGE SYSTEM IN WHICH THE INDIVIDUAL SHELLS CAN BE INSERTED IN STORAGE TUBES

Klaus Hersemeyer, Kassel, and Klaus-Peter Pietrzok, Kaufungen, both of Fed. Rep. of Germany, assignors to Wegmann & Co. GmbH, Kassel, Fed. Rep. of Germany

Filed Dec. 9, 1983, Ser. No. 560,021

Int. Cl.[4] F41F *9/06*; F42B *37/02*

U.S. Cl. 89—34 **3 Claims**



1. An ammunition-stowage system comprising: at least one storage tube receptive at the rear thereof of an individual shell having a base and a body; and braking means positioned on each storage tube for braking the longitudinal movement of a shell inserted into the tube, the braking means comprising a braking block disposed at the front of the storage tube to be adjacent the body of an inserted shell, two parallel connecting rods mounting the braking block for pivotal movement from a rest position to a braking position wherein the block rests against the shell body and brakes its forward motion, a system of rods pivotally connected at one end to the connecting rods and movable axially towards the front of the tube to pivot the braking block into its braking position, a plate at the rear end of the system of rods, a stop slidably mounting at the rear of the tube in the path of the base of a shell to be inserted and for movement towards the front of the tube including spring biasing means the stop away from the front of the tube, and a plurality of pins connected to the stop and spaced from the plate and movable into the plate in response to contact of the stop with the shell base to thereby move the system of rods and pivot the braking block.

4,598,624

VACUUM-OPERATED BRAKE POWER BOOSTER

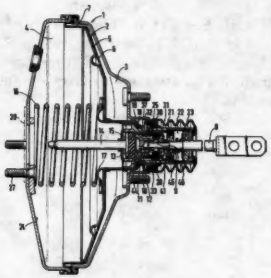
Wilfried Wagner, Hattersheim, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Oct. 12, 1984, Ser. No. 660,467

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 3337981; Oct. 22, 1983, 3338458

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—369 R **9 Claims**



1. A vacuum operated brake booster comprising an axially movable wall sealed relative to a vacuum housing, said booster having a piston rod adapted to be coupled to a brake pedal for movement between a brake released position and an actuated position serving to actuate control valve means by means of which a power chamber of the brake power booster is connectable selectively to vacuum or to an elevated pressure, in which a first valve is defined by a first valve seat on a control valve body portion of said control valve means and a poppet valve preloaded in the direction of said first valve seat and a second valve is defined by said poppet valve and a control valve piston portion of said control valve means, said control valve piston operatively connected to said piston rod, the axially movable wall being in effective linkage with said control valve body, a guide provided in said control valve body, said guide extending at right angles to the longitudinal axis of said control valve body and in effective linkage with a transverse member which extends through said guide with one end of the transverse member projecting beyond the peripherial surface of said control valve body to touch against said vacuum housing in the release position, the invention in which the poppet valve includes a front area at one end thereof facing said control valve piston defining a second valve seat, the front area being strengthened by a liner, said liner includes a portion which projects beyond said front area in the axial direction of the booster, the portion being provided with at least one recess engaged by said radially extending transverse member.

4,598,625

VACUUM-OPERATED BRAKE POWER BOOSTER

Juan Belart, Walldorf, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Oct. 15, 1984, Ser. No. 661,169

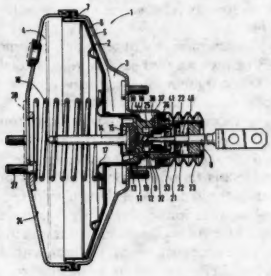
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 3337894

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—369 R **8 Claims**

1. A vacuum-operated power booster comprising an axially movable wall sealed relative to a vacuum housing, said booster including a piston rod adapted to be coupled to a brake pedal for movement between a brake release position and a fully braked position and which serves to actuate control valve means including a control valve body, a control valve piston and a poppet valve by means of which a power chamber is selectively connectible to a vacuum or to a more elevated atmospheric pressure, and in which a first valve located in a

first passageway between said power chamber and a vacuum chamber of said booster is defined by a first valve seat on the control valve body and a circumferential shoulder on the poppet valve at a location intermediate a front area and a rear end of said poppet valve, means for preloading said poppet valve in a direction toward said first valve seat whereby said first valve is maintained normally closed in the brake release position, and a second valve located in a second passageway between said power chamber and the atmosphere is defined by the front area of the poppet valve and a second valve seat located on the control valve piston, the second valve also being maintained normally closed in the brake release position, the axially movable wall being in effective linkage with said control valve body, a guide extending through said control



valve body at right angles to the longitudinal axis of said control valve body, said guide being in effective linkage with a transverse member having a portion extending through said guide, said portion projecting beyond the peripherial surface of said control valve body across said first passageway and having one end thereof sealingly engaged against said vacuum housing in the release position of the brake, the portion of the transverse member extending through said guide in said control valve body is in effective linkage directly with said poppet valve and includes a radial internal end sealingly engaged in a recess in the poppet valve in the release of the brake, whereby said first passageway is closed by said transverse member when in the release position of the brake at a location along the first passageway on a side of said first valve closest to said power chamber.

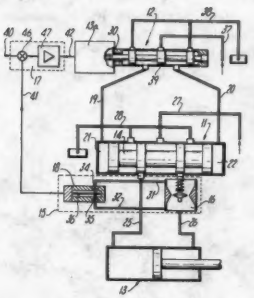
4,598,626

FEEDBACK CONTROLLED HYDRAULIC VALVE SYSTEM

Ronald B. Walters, Wembley, and John A. G. Hammond, Hayling Island, both of England, assignors to Vickers, Incorporated, Troy, Mich.

Continuation of Ser. No. 408,757, Aug. 17, 1982, abandoned.
This application Dec. 24, 1984, Ser. No. 685,204
Claims priority, application United Kingdom, Aug. 21, 1981, 8125584
Int. Cl.[4] F15B *11/10*
U.S. Cl. 91—433 **8 Claims**

1. A system for controlling the flow of hydraulic fluid to hydraulic actuator means, comprising fluid actuator means, a fluid pressure operated four-way main valve having ports, service lines connected to said ports and extending to said actuator means, a supply line and a tank return line, a pilot valve for controlling said main valve, said main valve regulating the flow of fluid to the actuator means, electrical input means for an electrical demand input signal, flow sensing means for producing an electric feedback signal dependent on the rate of fluid flow to the actuator means, and means for comparing the feedback signal with the demand signal and for operating the pilot valve accordingly, in which the flow sensing means comprise a flow sensing variable orifice means located in a port of the main valve to which is connected one of said fluid service lines to said actuator means, to measure fluid flow in said one fluid line by a pressure differential across said flow sensing orifice, and pressure transducer means hydraulically connected to opposite sides of said flow sensing orifice of said flow sensing device to receive and convert the



generated pressure differential into the electric feedback signal such that the feedback signal is developed by the pressure differential across the orifice and results in a feedback signal even when the fluid flow is insufficiently high to overcome frictional forces on the movable element and the preload on the flow sensing means.

4,598,627

FLUID MOTORS

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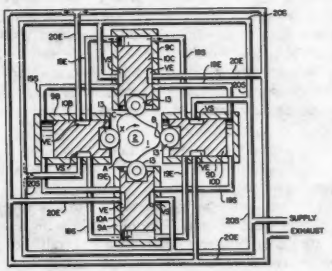
PCT Filed Nov. 1, 1982, Ser. No. 511,140
Claims priority, application United Kingdom, Nov. 2, 1981, 8133005
Int. Cl.[4] F01B *1/00*
U.S. Cl. 91—477 **9 Claims**



1. A fluid motor having two relatively rotatable parts, one of said parts comprising a cam member having at least three similar lobes and the other of said parts having at least four cylinders, a reciprocatable piston located in each cylinder, two separate oppositely disposed cavities in the wall of each piston, two pairs of ports in the wall of each cylinder, each one of said pairs of ports cooperating with one of said cavities thereby to provide two individual slide valves, said two slide valves operating simultaneously with the reciprocation of the piston such that one slide valve controls the supply of fluid to a preceding piston in the direction of rotation of the motor and the other slide valve controls the exhaustion of fluid from a succeeding piston in said direction of rotation, the rotation of

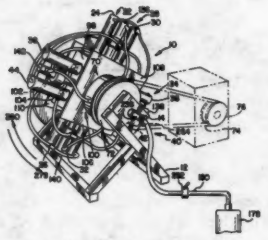
said motor being effected by the force of said pistons acting on said cam member.

4,598,628

ROTARY HYDRAULIC ENGINE HAVING OPPOSITELY DISPOSED PISTONS IN A SCOTCH YOKE ASSEMBLY

Harold D. Courtright, McDonald, Kans., assignor to 4 Square Motors, McDonald, Kans.

Filed May 21, 1984, Ser. No. 612,252
Int. Cl.[4] F01B *13/06*
U.S. Cl. 91—481 18 Claims



1. A rotary hydraulic engine comprising, in combination;
frame means;
crankshaft means supported by said frame means in substantially fixed relation therewith and having an eccentric crank portion;
housing means encircling said crankshaft means and being rotatable relative thereto, said housing means defining a plurality of pairs of cylinders disposed in laterally opposed sets such that each cylinder is laterally opposed to and co-axial with an opposed cylinder;
a piston slidingly disposed within each of said cylinders;
a scotch yoke assembly having a pair of discrete slide members each of which interconnects the pistons disposed within said laterally opposed sets of cylinders and has cooperative relation with said eccentric crank portion so as to effect tandem movement of said interconnected pistons and thereby effect relative movement between said housing means and said crankshaft means;
external valve means operatively associated with each of said cylinders so as to enable selective application of fluid pressure to said pistons in a manner adapted to effect predetermined sequential movement of said pistons and associated scotch yoke assembly, thereby imparting rotary motion to said housing;
means operatively associated with said housing means so as to enable transfer of the rotary motion of said housing means to an external apparatus;
a plurality of shuttle valve members radially disposed and extending from the periphery of said housing, each of said shuttle valve members containing a plurality of ports for selectively permitting the passage of said fluid pressure through a shuttle valve member to a selected one of said cylinders, and for the venting of said fluid pressure from a selected other one of said cylinders through a shuttle valve member; and
a shuttle valve piston slideably contained within each of said shuttle valve members, said shuttle valve pistons being connected to a shuttle valve piston arm, which in turn is connected to said one of said slide members of said scotch yoke assembly so that each of said shuttle valve pistons reciprocates in tandem with the slide member to which it is connected, thereby sequentially opening or closing selected ones of said plurality of ports within said shuttle valve member, whereby said fluid pressure is selectively directed to or from said pistons, as required.

5. A rotary hydraulic engine comprising;
a stationary crank shaft having an eccentric crank portion disposed thereon;
a housing rotatable about said crankshaft;
four pairs of cylinders connected to said housing and quadrilaterally disposed thereon, each of said cylinders being oppositely disposed from its pair;
four pairs of pistons slidingly disposed within said four pairs of cylinders, and oppositely disposed from each other, each of said cylinders containing a respective piston, and each of said pairs of pistons being connected so as to move in tandem when propelled by a fluid under pressure;
a tank of compressed air for providing said fluid under pressure to said four pairs of cylinders;
external valve means connected to said four pairs of cylinders for selectively permitting the passage of said fluid under pressure, thereby sequentially actuating said four pairs of pistons;
a scotch yoke assembly for integrating the motion of said four pairs of pistons, said scotch yoke assembly comprising a first slide member having arms connecting said first and second pairs of pistons and a second slide member having arms connecting said third and fourth pairs of pistons;
said first and second slide members having respectively first and second slots therein disposed at right angles to each other and adapted for reception of said eccentric crank portion of said stationary crank shaft, whereby said motion of said four pairs of pistons is integrated by the interaction of said eccentric crank portion with said first and second slots, thereby effecting sequential reciprocation of said four pairs of pistons, said sequential reciprocation of said four pairs of pistons in turn imparting a rotary motion to said housing;
transmission means for conveying said rotary motion of said housing to a selected external apparatus, as desired; and
a windmill constructed and arranged for driving said engine and selectively engageable therewith, thereby effecting rotation of said housing in a first direction so as to pump said compressed air into said tank, whereby said improved rotary engine may be selectively utilized to store energy in the form of compressed air in a first mode and to utilize said stored energy to drive said engine in a second mode.

4,598,629

COMPACT ASSISTED STEERING MECHANISM

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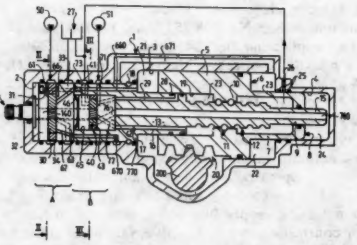
Filed Jun. 5, 1985, Ser. No. 741,496
Claims priority, application Spain, Jun. 27, 1984, 533.744
Int. Cl.[4] F15B *13/06*
U.S. Cl. 91—519 12 Claims



1. Compact assisted steering mechanism, incorporating a casing (1), a first piston (5) sliding in a sealed manner in a first cylindrical housing (3) of the casing and defining a first pair of opposed actuating chambers (21, 23), the first piston incorporating internally nut means (10) co-operating with a spindle (13) incorporating a threaded portion (12) and connected to an

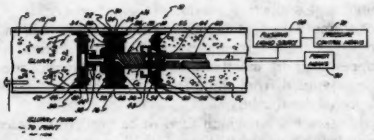
input shaft (14) of the mechanism, and externally, rack means (20) meshing with an output pinion (200) of the mechanism supported so as to rotate in the casing (1), and a first pair of passage means (660; 670, 671), in the casing to supply selectively the chambers of the first pair of chambers with fluid under pressure, characterized in that the mechanism incorporates a second piston (8), connected mechanically to the first piston (5) and sliding in a sealed manner in a second cylindrical housing (4) of the casing (1), which is coaxial with the first housing (3), and defining a second pair of opposed actuating chambers (23, 24) separated in a sealed manner from the chambers (21, 22) of the first pair of chambers, and a second pair of passage means (760, 770), in the casing, distinct from the first pair of passage means to supply selectively the chambers of the second pair of chambers with fluid under pressure.

4,598,630

DOUBLE ACTING SELF-FLUSHING PUMP

David T. Kao, Lexington, Ky., assignor to University of KY Research Foundation, Lexington, Ky.

Filed Apr. 24, 1985, Ser. No. 726,681
Int. Cl.[4] F15B *21/04*; F01B *31/00*
U.S. Cl. 92—78 **12 Claims**



1. A piston assembly for mounting in a mating cylinder to form a pump for slurry or the like, comprising:

a first piston, including a first peripheral sealing means;

a reciprocating means for driving said first piston within the cylinder;

a second piston, including a second peripheral sealing means, said second piston being adjacent one side of said first piston, said second piston forming a first enclosed chamber with said first piston and said cylinder;

a third piston, including a third peripheral sealing means, said third piston being adjacent an opposite side of said first piston, said third piston forming a second enclosed chamber with said first piston and said cylinder;

means for coupling said second and third pistons to said reciprocating means to provide lost motion and vary the size of the first and second chambers;

means for injecting flushing liquid into said first chamber during expansion thereof and into said second chamber during expansion thereof;

whereby on alternating strokes of the piston assembly flushing liquid is forced alternately past the second piston by contraction of said first chamber and past the third piston by contraction of said second chamber, said flushing liquid removing slurry particles around said second and third pistons to reduce wear during pumping operation.

4,598,631

INDOOR GUN FIRING RANGE ENCLOSURE

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Filed Sep. 4, 1984, Ser. No. 652,224
Int. Cl.[4] F24F *7/10*
U.S. Cl. 98—33.1 **8 Claims**

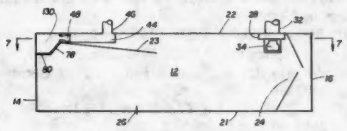
1. An indoor gun firing range comprising:

an enclosure having an uprange end wall, a downrange end wall spaced from and generally parallel to the uprange end wall, two spaced apart side walls interconnecting the uprange wall and downrange wall, a floor, and a ceiling having at least a portion sloping downwardly generally from the uprange end wall in a direction toward the downrange end wall;

gun shooting positions located a distance from the uprange end wall;

a bullet trap located at the downrange end wall; and,

an air circulation system for circulating air through the enclosure generally from the uprange end wall toward the downrange end wall comprising at least one air exhaust plenum open to the interior of the enclosure proximate the bullet trap and extending substantially completely across the width of the enclosure from one side wall to the other side wall of the enclosure for removing air from the enclosure, and an air supply plenum open to the interior of the



enclosure at the uprange end wall, the air supply plenum being located substantially at the intersection of the ceiling and the uprange end wall of the enclosure and extending substantially completely across the width of the enclosure from one side wall to the other side wall, the air supply plenum having a first air pervious diffusing wall oriented at approximately 45° to the vertical to discharge air at and angle from the intersection of the ceiling and uprange end wall, and a second air pervious diffusing wall horizontally oriented and extending from the first air pervious diffusing wall to the uprange end wall of the enclosure to discharge air vertically downwardly therefrom.

4,598,632

AIR-DRIVEN CEILING FAN

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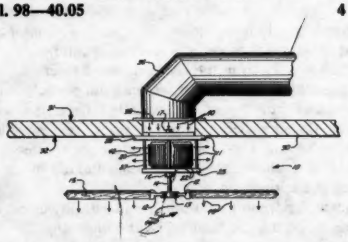
Filed Sep. 30, 1982, Ser. No. 428,889
Int. Cl.[4] F24F *13/06*
U.S. Cl. 98—40.05 **4 Claims**



1. An air driven ceiling fan apparatus comprising:

a. a housing which is positioned adjacent an opening in the ceiling of a room;

b. duct work means positioned above said opening and communicating with said opening for providing air flow through the opening into the room defined along an air flow path;

c. a vertical drive shaft rotatably connected to the housing and extending downwardly into the room;

d. blower means disposed in the housing and on the defined air flow path, being connected to said shaft, to receive air flow from the duct work means for rotating the shaft, the blower means including a plurality of spaced apart vanes which surround the opening so that air flow between the duct work means and the room passes through the vanes before entering the room;

e. a hub connected to the lowermost portion of the shaft for rotation therewith; and

f. a plurality of horizonally disposed pitched fan blades, spaced radially about the hub and extending therefrom, the fan blades being spaced a vertical distance below the ceiling lower surface whereby air flow from the duct work means dispensing from the blower means thereby driving the pitched fan blades.

4,598,633

TREATMENT BOOTH

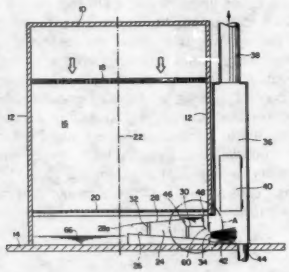
Eberhard Otto, Ludwigsburg; Rolf Mutschelknaus, Leonberg, and Andreas Hauptmann, Kernen, all of Fed. Rep. of Germany, assignors to Durr Anlagenbau GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 576,125, Feb. 2, 1984, abandoned. This application Jul. 23, 1985, Ser. No. 757,767

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1983, 3303338

Int. Cl.[4] B05B *15/12*

U.S. Cl. 98—115.2 **6 Claims**



1. Treatment booth having a working space bounded by side walls and by a perforated floor underneath which is located:

(a) an intermediate floor having a flow-off edge; and

(b) washing-liquid reservoir adjacent said intermediate floor for rinsing said intermediate floor with washing-liquid; said flow-off edge on a side of said intermediate floor facing away from the washing-liquid reservoir;

(c) a washing-out device for washing out particles or other impurities from spent air extracted from the working space through said perforated floor, said washing-out device having a slit-shaped nozzle orifice extending approximately horizontally and being limited by an upper edge and a lower edge; and

(d) means for feeding said upper and said lower edge with washing-liquid, the improvement comprising:

(i) a spent-air channel disposed underneath said intermediate floor and extending approximately horizontally from said flow-off edge over a distance of at least 20 cm to said nozzle orifice wherein said intermediate floor and said washing liquid reservoir are arranged to form a cover between the nozzle orifice and the working space for shielding the working space against noise generated at the nozzle orifice;

(ii) an expansion chamber adjoining the nozzle orifice, said expansion chamber being disposed outside the side walls of the working space, and extending in a substantially vertical direction;

(iii) means for providing access to said nozzle and said expansion chamber for cleaning and maintenance; and

(iv) a washing-liquid guide channel is provided, said guide channel extending directly from said reservoir to said nozzle orifice, bypassing said intermediate floor, for providing the washing-liquid to said nozzle orifice.

4,598,634

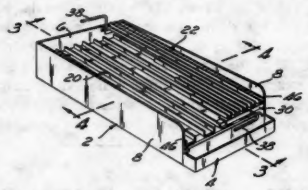
BROILER/GRIDDLE

William E. Van Horn, II, Upland, Calif., assignor to CCI Industries, Rancho Cucamonga, Calif.

Filed Jan. 22, 1985, Ser. No. 693,573

Int. Cl.[4] A47J *37/06*

U.S. Cl. 99—340 **6 Claims**



1. A portable range top cooking apparatus, comprising:

a fire box having three vertical walls forming a back and two substantially parallel sides which are substantially normal to the back, and having an open front, top, and bottom, said fire box being adapted to be placed on top of a cooking range and surround one or more burners;

a set of upper support members within said fire box, and a set of lower support members which is underneath said set of upper support members, said sets of support members being angled from the horizontal to decline toward the front of the fire box;

a grid assembly on which food to be broiled is placed, the grid being removably disposed within said fire box on said upper support members, and forming a pitched broiling surface allowing grease to drain off the front of the grid assembly, said grid assembly having a plurality of openings to allow grease to drip through the grid assembly and down to the burners, and to allow heat and flame to vent through the grid assembly and to contact directly the food being grilled;

a base assembly removably disposed on said lower support members and decling toward the front of the fire box to catch and drain off the front of the base assembly a substantial portion of the grease which drips through the grid assembly, said base assembly having a plurality of openings which allow heat and flame to pass through the base assembly and directly contact the food being broiled on the grid assembly;

a grease cup attached to the front of the fire box and positioned to catch grease dripping off the front ends of the declining grid and assemblies; and

a griddle which is removably interchangeable with the grid assembly on the upper support members, said griddle comprising a substantially planar and imperforate frying surface on which food is fried, said frying surface being surrounded by three vertical walls forming two substantially parallel sides and a back substantially normal to the sides, so that all drainage from the frying surface is directed off the unenclosed front of the frying surface and into the grease cup, aided by the decline imparted to the griddle by the upper support members.

4,598,635

REVOLVING SAUCEPAN TURNTABLE

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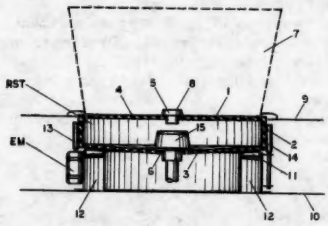
Filed Jun. 3, 1985, Ser. No. 740,703

Int. Cl.[4] A47J *37/00*

U.S. Cl. 99—348 **1 Claim**

1. A cooking appliance comprising a revolving saucepan turntable (RST), an annular frame (12) positioned beneath and supporting said turntable, said turntable comprising a support rack (1), a cylindrical wall (2) and a conical base (3), said support rack comprising eight radial rods (4) occupying a

horizontal plane and an elevated central hub (5), said rods extending outwardly from said hub to an upper edge of said cylindrical wall to which said rods are integrally adjoined, said cylindrical wall comprising a hollow cylinder having a smooth outer surface, an electric motor (EM) mounted on said annular frame and having a rubber-rimmed shaft which is adapted to engage and revolve said turntable and a saucepan thereon, said



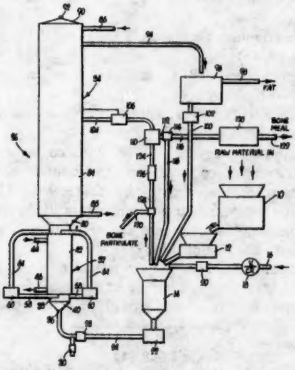
conical base comprising a conical plate having a central opening (6) therein and adapted to receive a stem of a gas burner therethrough, said annular frame having a plurality of tapered rollers (11) thereon and adapted to support an outer outside surface of said conical plate to rotatably support said turntable, said annular frame comprising concentric inner and outer cylindrical members adapted to be riveted to a base of a burner.

4,598,636

BONE EMULSIFYING APPARATUS

Wallace L. McGehee, 1004 W. 88th St. Ter., Kansas City, Mo. 64114

Division of Ser. No. 573,304, Jan. 23, 1984, Pat. No. 4,548,829. This application Jul. 8, 1985, Ser. No. 752,526
Int. Cl.[4] A47J *27/00*; A23L *1/31*
U.S. Cl. 99—353 **6 Claims**



1. Apparatus for use in emulsifying animal bones and the like in a continuous process comprising:
- means for reducing bones into particles;
- means for combining the bone particles with a liquid to produce a slurry;
- a tubular cooking tower adapted at its lower end to receive the slurry and to subject the same to applied heat as the slurry is passed upwardly through the tower;
- means associated with the tower for subjecting the particles within the slurry to further disintegration as heat is applied; and
- means for drawing off cooked product from the tower above the lower end thereof.

4,598,637

AUTOMATIC BEAN SHELLER

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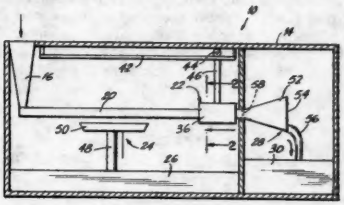
Filed Aug. 29, 1984, Ser. No. 645,417
Int. Cl.[4] A23N *5/00*
U.S. Cl. 99—580 **5 Claims**



1. An apparatus for shelling beans which comprises:
- (a) an elongated horizontal housing, having a center, a bottom and opposite ends;
- (b) a vertical chute mounted within one of said ends to receive a plurality of said beans having pods;
- (c) a horizontal conduit mounted within said center of said housing and connected to said chute to carry said beans therethrough;
- (d) slicer assembly moveably mounted on said housing having means for movement along said conduit and piercing said beans on the top and bottom of the bean pods and separate said pods therefrom;
- (e) a second means for removing said pods from said conduit wherein said second means is part of said slicer assembly;
- (f) a first container within said bottom of said housing for storing said pods;
- (g) a third means for removing said shelled beans from said conduit; and
- (h) a second container within said bottom of said housing for storing said shelled beans.

4,598,638

LATERAL PERFORATION VERTICAL REGISTRATION DEVICE FOR OFFSET PRESS

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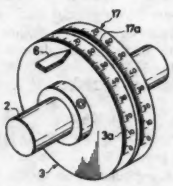
Filed Mar. 1, 1985, Ser. No. 707,251
Claims priority, application Japan, Mar. 2, 1984, 30970[U]
Int. Cl.[4] B41F *13/12*; B41L *49/02*; B41G *7/00*
U.S. Cl. 101—76 **2 Claims**



1. A lateral perforation vertical registration device for an offset press comprising: a lateral perforation position reading plate made of a transparent material having a lateral scale and a vertical scale, said lateral perforation position reading plate being placed on a printing paper before lateral perforation is effected to determine a position of lateral perforation; a rotary numbering device mounting shaft carrying a numbering device; a first vertical scale mounted on said numbering device

mounting shaft for indicating a perforation location; a rotary lateral perforating device mounting shaft mounted parallel to said numbering device mounting shaft; lateral perforating means having a perforating blade mounted on said lateral perforating device mounting shaft; an impression cylinder disposed between said numbering device mounting shaft and said lateral perforating device mounting shaft; a second vertical scale provided on an outer peripheral surface of said numbering device mounting shaft for indicating a numbering location; a first pointer fixedly mounted adjacent said first and second scales; and a second pointer fixedly mounted adjacent said lateral perforating means, the position of the first and second scales being relatively adjustable and said scales being fixedly connectable to said numbering device mounting shaft.

4,598,639

POSTAL METER VALUE SELECTOR SYSTEM

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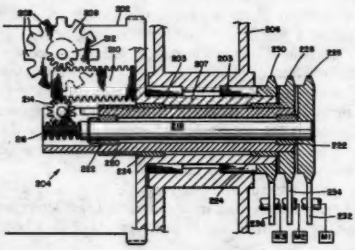
Filed Oct. 4, 1984, Ser. No. 657,698

Int. Cl.[4] B41K 3/08; B41J 1/34

U.S. Cl. 101—110 5 Claims



1. A postage meter for printing selected value amounts on a print receiving surface, comprising:

a support,

a plurality of value print devices mounted on said support, said devices each having a plurality of value print elements and being selectively movable to align selected value print elements,

means for driving said support to move selected value print elements through a printing position to form an imprint on a said print receiving surface,

a plurality of racks connected to respective value print devices for adjusting same and rack displacement means engageable with said racks one at a time for displacing said racks to adjust the associated value print devices,

means for shifting said racks with respect to said rack displacement means for engaging said racks with said rack displacement means one at a time, and

means for driving said rack displacement means and said rack shifting means.

4,598,640

PRINTING UNIT FOR A WEB-FED OFFSET ROTARY PRESS

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Filed Apr. 5, 1985, Ser. No. 720,524

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1984, 3412812

Int. Cl.[4] B41F 7/02; B41L 17/18

U.S. Cl. 101—177 10 Claims

1. A printing unit for a rotary offset printing machine having side walls (1) formed with bores (A, B) therein;

four printing cylinders (2, 3, 4, 5) located one above another between the side walls, the centers of the printing cylinders being located close to a straight line extending obliquely with respect to the path of printed substrate that can be fed between the two inner cylinders (3, 4),

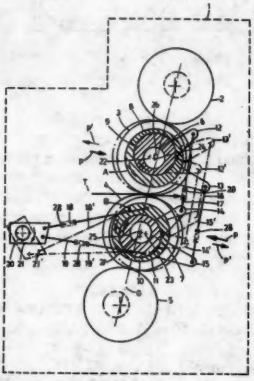
said two inner cylinders having extending trunnions (6, 7) and forming blanket cylinders,

and comprising, in accordance with the invention,

means for separating the inner blanket cylinders (3, 4) from each other without effectively changing the position of the outer cylinders (2, 5) comprising

two eccentric bushes (8, 9; 10, 11) positioned within each other and located in the bores (A, B) in the printing unit side wall, the inner ones (9, 11) of the eccentric bushes retaining the trunnions (6, 7) of the inner or blanket cylinder (3, 4);

said eccentric bushes (8, 9; 10, 11) having substantially the same eccentricity;



a first common tie rod (16) joining the outer eccentric bushes (8, 10);

a second common tie rod (17) joining the inner eccentric bushes (9, 11);

a first control rod (18) joined to at least one of the outer eccentric bushes (7, 8);

a second control rod (19) joined to at least one of the inner eccentric bushes (9, 11);

and an adjusting device (20, 21) coupled to said first and second control rods to shift the control rods, and to thereby rotate the eccentric bushes (8, 9; 10, 11) by essentially the same angular amount within the bores (A, B) so that the blanket cylinders (3, 4) will each move with respect to the straight line (G);

the axial centers (24) of the cylinder trunnions (6, 7) being located at a position on or at least close to and only slightly spaced from said straight line (G).

4,598,641

PRINTING CYLINDER CONSTRUCTION FOR SHEET-FED OFFSET ROTARY PRINTING MACHINE

Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Feb. 4, 1985, Ser. No. 697,735

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1984, 3403893

Int. Cl.[4] B41F 21/04

U.S. Cl. 101—246 20 Claims

1. Sheet-fed rotary offset printing machine having

a printing couple including a rubber blanket cylinder structure (1) and a printing cylinder (2); and

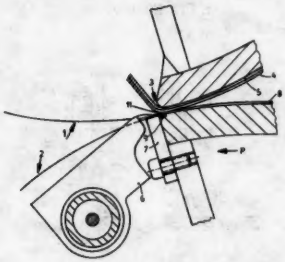
a gripper structure having movable gripper elements (6) and

an engagement surface (7) secured to the printing cylinder, for gripping a sheet (8) between the gripper structure and the engagement surface, and pulling the sheet through a printing line between the rubber blanket cylinder and the printing cylinder,

and comprising, in accordance with the invention,

means for insuring reliable gripping of the sheet, without slippage, between the gripper structure (6) and the engagement surface (7), including

penetrating projection means (11, 12) positioned on the printing cylinder and located--with respect to the direc-



tion of rotation (P) of the printing cylinder (2)—in a zone extending from close to and behind the engagement surface to, and including the engagement surface,

the penetrating projection means being located for penetration of a sheet (8) by the projection means (11, 12), said blanket cylinder structure serving as a means for applying a force against the sheet to cause said projection means to penetrate said sheet as the sheet is held by the gripper elements and as the blanket cylinder structure rotates, said force acting in a direction which presses the sheet onto said projection means.

4,598,642

PLATE CYLINDER FOR INTAGLIO PRINTING PLATES IN A WEB PRINTING MACHINE

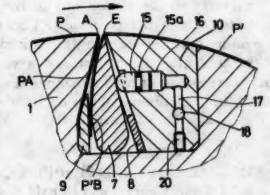
Hartmut K. Saüer, Himmelstadt, and Albrecht J. Germann, Würzburg, both of Fed. Rep. of Germany, assignors to De La Rue Giori S.A., Switzerland

Filed Oct. 24, 1984, Ser. No. 664,486

Claims priority, application Switzerland, Nov. 14, 1983, 6111/83

Int. Cl.⁴ B41F *27/12*

U.S. Cl. 101—415.1 **8 Claims**



1. A plate cylinder for mounting intaglio printing plates with radially folded plate ends in web-fed printing machines comprising:

a body with a body axis and a cylindrical surface formed with at least one groove defined by a first boundary wall, a bottom, and a second boundary wall and opening towards said surface;

fastening means provided for said plate ends and comprising:

a tightening bar having a wedge-shape with a major dimension oriented radially, and a rounded inner end contacting said groove bottom, said rounded inner end forming a rocking surface so that said tightening bar is tiltably supported in said groove, said tightening bar being loosely disposed within said groove;

a tightening device disposed in said first boundary wall and consisting of a plurality of hydraulic pistons positioned axially along the first boundary wall arranged to selectively tilt the tightening bar away from said first boundary wall when pressurized for tensioning a plate;

a rigid clamping piece disposed between said tightening bar and said second boundary wall, said clamping piece being formed with two generally radial side walls and extending along said secondary boundary wall, said clamping piece having a radial dimension which is less than the radial dimension of said second boundary wall, a slot for engaging one of said plate ends being located adjacent each of said radial side walls; and

a blocking support disposed between said first boundary wall and said tightening bar for maintaining said tightening bar away from said first boundary wall after said hydraulic pistons are depressurized;

said tightening bar and said clamping piece cooperating to clamp simultaneously the plate ends and to tension the plate as said tightening bar is tilted by said tightening device.

4,598,643

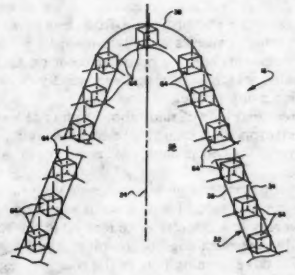
EXPLOSIVE CHARGE LINER MADE OF A SINGLE CRYSTAL

Roger R. Skrocki, Concord Township, Lake County, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Dec. 18, 1984, Ser. No. 682,786

Int. Cl.⁴ F42B *1/00*

U.S. Cl. 102—307 **7 Claims**



1. A liner for use with an explosive charge, said liner comprising a metal side wall having an outer side surface which is adapted to be engaged by an explosive charge and an inner side surface, said inner side surface of said side wall defining a cavity which flares outwardly from a closed end to an open end said open end of the cavity being adapted to be positioned adjacent to an article to be subjected to an impulse force upon detonation of the explosive charge, said side wall being formed of a single crystal of metal and being free of grain boundaries, said single crystal of metal being formed of unit cells all having the same orientation relative to the central axis of the cavity to tend to optimize performance of said liner upon detonation of the explosive charge.

4,598,644

USE OF A PORTION OF A PROPELLANT CHARGE AS A SEAL

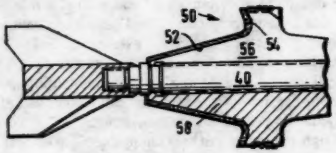
Rudolf Romer, Kaarst; Walter Simon, Herzogenrath; Jürgen Boecker, Oberhausen, and Bernhard Bisping, Ratingen, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 444,983, Nov. 29, 1982, abandoned. This application Apr. 8, 1985, Ser. No. 720,490

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1981, 3148264

Int. Cl.[4] F42B *13/16*

U.S. Cl. 102—521 3 Claims



1. In an improved subcaliber projectile, with a sabot around the middle of the projectile body, adapted to be fired from a gun barrel or the like by means of a propellant charge, the improvement comprising:

(a) said sabot formed by a plurality of separable adjoining segments whose exterior peripheries are held together by means of at least one annular guide or sealing band until the sabot leaves the muzzle of the gun barrel

(b) said segments jointly present a propellant charge gas pressure receiving surface and an air pressure receiving surface axially forwardly spaced from said gas pressure receiving surface, each pair of adjoining segments define at least one joint therebetween which extends through said propellant charge gas pressure receiving surface;

(c) a sealing membrane in the form of a foil, which is made of propellant charge material, is at least partially disposed in that portion of each joint which extends through said propellant charge gas pressure receiving surface and covers substantially the entirety of each joint,

(d) the front end face of said sabot forming an air pressure receiving pocket for receiving an air streaming upon emergence of the projectile from the muzzle of a gun barrel which causes a radially outwardly pivoting of said sabot segments about a pivoting point on said subcaliber projectile which is disposed rearwardly of said air pressure receiving pocket;

(e) the rear end face of said sabot forming at least a portion of said propellant charge pressure receiving surface for receiving the propellant gas pressure of a propellant charge;

(f) said propellant charge pressure receiving surface extends from the rear side of said annular guide or sealing band rearwardly to a circular edge formed at the rearmost and radially innermost edge of the plurality of segments, said circular edge forming part of the rear end region of each segment which is last to lose contact with the subcaliber projectile upon emergence from the gun barrel, rupture of said guide, and radially outward pivoting of the plurality of sabot segments;

(g) said sealing membrance prevents a penetration of propellant charge gases between the joint defined by the adjoining sabot segments and through a boundary contact zone between the sabot and the gun barrel, said sealing membrance consisting of a desensitized propellant charge powder which combusts in such a way that a uniform and undisturbed separation of the plurality of sabot segments is effected after their emergence from the gun barrel;

(h) said gas pressure receiving surface being inclined relative to the longitudinal axis of the subcaliber projectile; and

(i) said foil consists of a propellant charge material whose burning velocity is such that a sealing of the joints between the segments occur only when the projectile passes through the gun barrel.

4,598,645

RAILWAY TRACK TAMPER

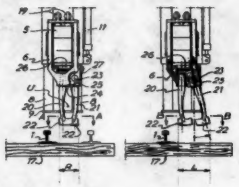
Jörg Ganz, Etoy, Switzerland, assignor to SIG Societe Industrielle Suisse, Neuhausen-Chutes du Rhin, Switzerland

Continuation of Ser. No. 447,328, Dec. 6, 1982, abandoned. This application Nov. 20, 1984, Ser. No. 674,462

Claims priority, application Switzerland, Dec. 10, 1981, 7885/81

Int. Cl.[4] E01B *27/16*

U.S. Cl. 104—12 4 Claims



1. A railway track tamper for tamping switch gear as well as open track, comprising in combination:

(a) at least one tamping unit;

(b) a carrying frame mounted for vertical amount in said tamping unit;

(c) two levers mounted in opposition on said carrying frame, said levers being articulated on the carrying frame for oscillating and pivotal movement in a plane parallel to the direction of elongation of the track;

(d) at least two tamping picks mounted on each of said two levers, said two tamping picks forming in work condition on their respective lever one tamping tool located on one side of a line of rails of said track;

(e) an end blade on each of said tamping picks, the end blades of each of said tamping tools being juxtaposed at least in one of the directions transverse and parallel to the elongation of the track; and,

(f) guide means and power means affixed to each of said levers to cause a pivotal movement of at least one of its tamping picks in work condition in a direction opposite to the other tamping pick, whereby the end blades of the tamping tool are at variable relative work positions in the direction transverse to the elongation of the track, between a close-together work position (R) corresponding to the minimum compacting length desired for each plunge of the tool into the ballast and a spaced work position (L) corresponding to the maximum compacting length desired for each plunge of the tool into the ballast.

4,598,646

HIGH VOLUME COVERED HOPPER CAR

Richard H. Dugge, St. Louis County, and Donald E. Gruner, St. Charles County, both of Mo., assignors to ACF Industries, Incorporated, Earth City, Mo.

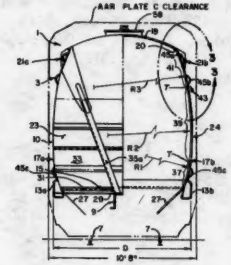
Filed Jan. 22, 1985, Ser. No. 693,186

Int. Cl.[4] B61D *7/02, 17/08*

U.S. Cl. 105—248 12 Claims

1. In a center stub sill covered hopper car having a center stub sill assembly at each end of the car, a side sill extending longitudinally of the car at or above the approximate elevation of said center stub sill assembly, means joining said side sills to said center stub sill assembly, a side sheet secured to each of said side sills and extending upwardly thereabove so as to constitute a side of said car, a roof secured to the upper ends of

said side sheets, an end sheet at each end of said car secured to the ends of said side sheets so as to define the ends of said car, and at least one intermediate partition sheet extending between and secured to said side sheets thereby to divide said car into a plurality of hoppers, wherein the improvement comprises: each of said side sheets having a first radius of curvature in a first region thereof extending upwardly from its respective said side sill, a second radius of curvature of a second region of said side sheet extending from said first region so as to constitute a major portion of the side walls of said car, and a third radius of curvature of a third region of said side sheet extending generally upwardly from the upper margins of said second region to said roof, said first radius of curvature being relatively short so as to provide substantial resistance to buckling of said side sheet in said first region, said second radius of curvature being at least two times greater than said first radius of curvature such that said second region of said side sheet is substantially vertical thereby to facilitate maximizing the lading volume of said car, and said third radius of curvature being also relatively short in comparison to said second radius of curvature so as to provide substantial resistance to buckling of said side sheets in said third region.

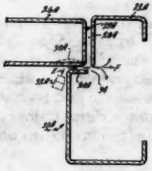


4,598,647

SHRAPNEL PROOF DOOR FRAME

Frederick F. Biedess, Oak Lawn, Ill., assignor to National Bullet Proof, Inc., Hickory Hills, Ill.

Filed Mar. 16, 1984, Ser. No. 590,244
Int. Cl.[4] E06B *1/04*
U.S. Cl. 109—77 **8 Claims**



1. A bulletproof door and door jamb construction, comprising:

a door composed of a material having adequate strength to prevent penetration by a bullet fired from a specified gun; and

a door frame defining a door opening, said frame being composed of a material having adequate strength to prevent penetration by a bullet fired from a specified gun, said frame including a door jamb having means defining an opening extending vertically for the entire height of said door jamb for receiving bullet fragments to divert them away from a path of travel into the space between said door and said door frame, said opening being suitably dimensioned to receive the bullet fragments, said opening being disposed on the threat side of the door in line with the plane of the door;

wherein said door jamb includes a hollow interior, said opening communicating with said hollow interior to permit the bullet fragments to be guided through said opening and into said hollow interior for causing them to lose their energy in a safe manner; and

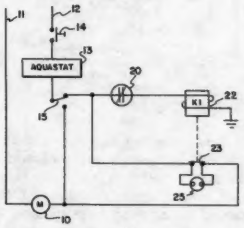
further including a generally C-shaped piece fixedly connected to the hollow inside of the door jamb opposite the door stop, said opening being positioned at the intersection of said door stop with the plane of the door jamb.

4,598,648

FIRE FAILURE SAFETY CONTROL FOR STOKERS

Joseph T. D'Angelo, 523 E. Mahanoy Ave., Mahanoy City, Pa. 17948

Filed Jun. 21, 1985, Ser. No. 747,198
Int. Cl.[4] F23N *5/24*
U.S. Cl. 110—193 **8 Claims**



1. In a heating system including a stoker-fed furnace, a safety control for preventing operation of the stoker motor in the event of insufficient combustion in the furnace, comprising:

(a) thermostatic switch means for energizing and deenergizing said motor,

(b) time delay means including normally closed contacts in circuit with said thermostatic switch means and said motor,

(c) heat sensitive switch means including normally closed contacts in the energizing circuit for said relay means,

(d) said heat sensitive switch means being located at a position in said system subject to exposure to heat emanating from said furnace and being adapted to open its said normally closed contacts in response to increase in the heat above a predetermined value which is representative of sufficient fire in said furnace to maintain standby combustion therein and thereby to maintain said relay deenergized and said contacts thereof closed, and

(e) said time delay relay means being adapted to maintain said normally closed contacts thereof closed for a sufficient time interval after being energized for combustion in said furnace to increase the heat at said position from standby conditions to said predetermined value.

4,598,649

PARTICLE FUEL DIVERSION STRUCTURE WITH DOME-SHAPED CAVITY

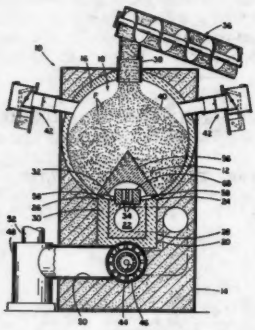
Roger D. Eshleman, Waynesboro, Pa., assignor to Eshland Enterprises, Inc., Greencastle, Pa.

Filed Sep. 3, 1985, Ser. No. 771,750
Int. Cl.[4] F23B *5/00*; F23C *9/00*; F23G *7/00*
U.S. Cl. 110—211 **6 Claims**

1. In a particle fuel burning furnace having an upper particle fuel holding and combustion chamber, a lower combustible gas afterburning chamber and means forming at least one passageway interconnecting a bottom of said upper chamber and a top of said lower chamber, an improved particle fuel diversion structure comprising:

(a) an elongated fuel diverter block having a recessed cavity formed therein; and

(b) means disposing said diverter block in said upper chamber in spaced relationship above said bottom of said upper chamber and with its recessed cavity overlying said passageway, said diverter block coacting with said upper chamber bottom and said passageway-forming means to



define a flow path from said upper chamber to said lower chamber which passes along said bottom of said upper chamber under said diverter block, upwardly into said cavity of said diverter block, and then downwardly through said passageway so as to cause an increase in the dwell time of flow entrained particles in said upper chamber and thereby promote combustion of said particles before they reach said lower chamber.

4,598,650

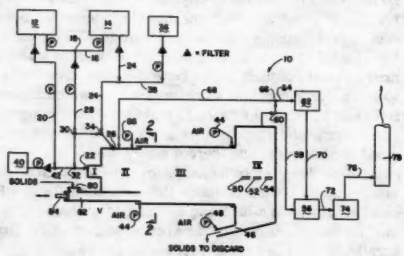
FLUID AND SOLID WASTE INCINERATION SYSTEM

Marc G. Schneckenberger, 7751 S. 72nd East Pl., Tulsa, Okla. 74133

Filed Oct. 21, 1985, Ser. No. 789,430

Int. Cl.[4] A47J *36/00, 36/24*

U.S. Cl. 110—246 **11 Claims**



1. A system for incinerating fluid and solid waste, comprising:

a first combustion zone having an inlet for the introduction of fluid waste through a burner system and an outlet,

a second combustion zone of a larger interior volume and diameter than the first combustion zone, the second combustion zone having an inlet for the introduction of emissions from the first combustion zone's outlet and an outlet,

a third combustion zone of a larger interior volume and diameter than the second combustion zone, the third combustion zone having a first inlet for the introduction of emissions from the second combustion zone's outlet, a second inlet adjacent the first inlet for the introduction of solid waste, and an outlet opposite from the first and second inlets for discharge of gaseous and solid emissions, and

means for introducing solid waste through the third combustion zone's second inlet, a portion of the introduction means being adapted to heat any solid waste therein from conduction and/or convection heat developed from the first and/or the second combustion zones.

4,598,651

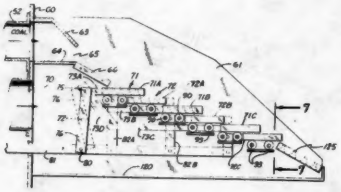
FURNACE WITH OSCILLATING GRATE

Dale M. Flickinger, Box 434, Spicer, Minn. 56288, and Mark D. Flickinger, Box 137, Aneta, N. Dak. 58212

Filed Sep. 21, 1984, Ser. No. 653,680

Int. Cl.[4] F23H *7/08*

U.S. Cl. 110—280 **7 Claims**



1. A furnace construction comprising a furnace cabinet having a solid fuel burner therein, wherein the burner comprises:

a pair of burner side walls that are spaced apart in a longitudinal direction;

a solid fuel inlet opening portion between said side walls, and adjacent an upper portion thereof;

a plurality of three or more plate members arranged in a stepped arrangement, one above the other and each being partially offset in horizontal direction from the others in a descending arrangement from the solid fuel inlet;

means fixed to the side walls to independently support each of said plurality of plate members for substantially horizontal movement between said side walls for limited reciprocal horizontal movement, the means to support supporting each plate members independently on the side walls;

means independent of the means to support for driving said plate members along said means to support in generally horizontal movement; and

drive link connected to each of said plate members and including means to cause opposite reciprocal movement of every other one of said plurality of plate members so that when an adjacent lower plate is moving in a first horizontal direction the next plate member above is moving in the opposite horizontal direction to thereby tend to move solid fuel materials downwardly over said stepped plate members.

4,598,652

COAL COMBUSTION TO PRODUCE CLEAN LOW-SULFUR EXHAUST GAS

Malcolm T. Hepworth, Golden, Colo., assignor to Amax Inc., Greenwich, Conn.

Filed Sep. 4, 1985, Ser. No. 772,524

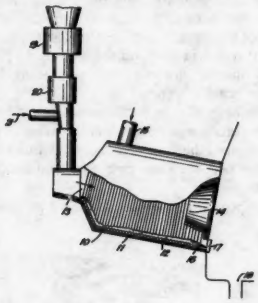
The portion of the term of this patent subsequent to Feb. 25, 2003, has been disclaimed.

Int. Cl.[4] F23J *11/00, 15/00*

U.S. Cl. 110—345 **16 Claims**

1. The process for combusting sulfur-containing coal while producing of off-gas low in sulfur which comprises combusting particulate coal in a furnace burner cavity providing rapid coal combustion, a hot, turbulent combustion zone and a com-

bustion temperature of at least about 1100° C. in the presence of a finely divided sulfur-fixing material from the group consisting of iron oxide, iron powder and copper oxide in amounts about 25% to about 100% in excess of the stoichiometric quantity required to produce metal sulfide based on the sulfur content of said coal distributed throughout said combustion zone and at least about 60% of the oxygen stoichiometrically



required for complete combustion of said coal to form a particulate liquid oxysulfide phase within a turbulent atmosphere of combustion-product gases, said liquid oxysulfide acting to scrub sulfur-containing gaseous species from said atmosphere to yield an essentially sulfur-free flue gas and a liquid oxysulfide slag containing essentially all the sulfur originally contained in said coal.

4,598,653

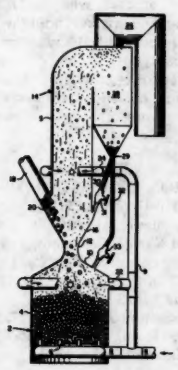
COMBUSTION SYSTEM FOR BURNING FUEL HAVING VARIOUS PARTICLE SIZES

Thomas E. Stringfellow, Aurora, and Warnie L. Sage, Littleton, both of Colo., assignors to Stearns Catalytic World Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 649,558, Sep. 12, 1984, Pat. No. 4,565,139. This application Jul. 17, 1985, Ser. No. 755,981

Int. Cl.⁴ F23D *1/00*

U.S. Cl. 110—347 **16 Claims**



1. A process for obtaining energy from a fuel source having particles ranging in size from fines to coarse by combusting said fuel in a combustion apparatus having an upper combustor and a lower combustor connected via a passageway, wherein a venturi is formed in said passageway such that the velocity of gases entering the passageway from the lower combustor is increased, said process comprising:

(a) introducing the fuel source, having fine and coarse particles into the combustion apparatus, at a point along or directly above the passageway;

(b) introducing an oxygen-containing gas into the lower combustor in a quantity sufficient to support combustion in the lower combustor;

(c) moving a gas stream upwardly through the passageway such that the fine particles are entrained in the gaseous stream and carried into the upper combustor, while the coarse particles fall into the lower combustor;

(d) combusting the fine particles in the upper combustor to generate heat;

(e) combusting the coarse particles in the lower combustor to generate heat; and

(f) using the generated heat to provide useful energy.

4,598,654

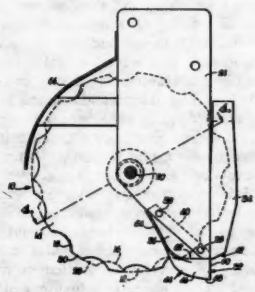
FURROW OPENER AND FOLLOWER BLADE

Forrest E. Robertson, and Donald E. Williams, both of Garden City, Kans., assignors to Acra-Plant, Inc., Garden City, Kans.

Continuation-in-part of Ser. No. 336,270, Dec. 31, 1981, abandoned, which is a continuation-in-part of Ser. No. 118,618, Feb. 4, 1980, abandoned. This application Apr. 5, 1984, Ser. No. 597,118

Int. Cl.⁴ A01C *7/20*

U.S. Cl. 111—88 **23 Claims**



1. In a farm implement, a furrow opener having:

a pair of metallic, upright, forwardly and downwardly converging, earth penetrating, plate-like disks having circular peripheries; and

a stub axle rotatably supporting each disk respectively;

said axles being disposed along axes inclined forwardly and downwardly at angles which hold a portion of the inner face of one of the disks in engagement with a portion of the inner face of the other disk at the lower leading edge of said one disk,

the disks being otherwise spaced apart throughout the peripheries thereof,

said disks being peripherally notched, presenting each disk with a series of notches and a series of teeth alternating with the notches.

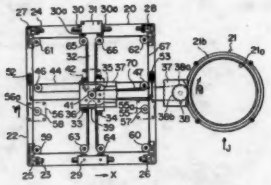
there being a greater number of notches on one disk than on the other disk whereby to preclude alignment of the notches of said one disk with the notches of said other disk at the zone of said engagement.

4,598,655

DRIVING DEVICE OF AN EMBROIDERY FRAME IN A ZIGZAG SEWING MACHINE

Hideaki Takenoya, Tokyo, Japan, assignor to Janome Sewing Machine Co. Ltd, Tokyo, Japan

Filed Mar. 27, 1984, Ser. No. 594,776
Claims priority, application Japan, Mar. 30, 1983, 58-52766
Int. Cl.[4] D05C 9/04; D05B 21/00
U.S. Cl. 112—103 2 Claims



1. An embroidery frame drive device used in combination with zigzag sewing machine having a needle which is laterally swingable and vertically reciprocated to form embroidery stitches on a fabric clamped by an embroidery frame, said drive device comprising:

a base plate; first and second movable means and mounted on said base plate; first, second guide means, said first guide means being adapted to guide said first and second movable means in one direction and said second guide means being adapted to guide said second movable means in a direction transversely of said one direction; support means including an elongated support member having one end secured to said second movable means and the other end supporting said embroidery frame; means operatively connected to said embroidery frame to rotate the latter; first, second and third electromagnetic actuators, each secured to said base plate, and first, second and third transmission means, said first transmission means being operatively connected between said first electromagnetic actuator and said first, and second movable means, said first electromagnetic actuator being driven in one direction to operate said first transmission means to thereby move said first and second movable means along said first guide means, said second transmission means being operatively connected between said second and third electromagnetic actuators and said second movable means, said second and third electromagnetic actuators being driven under independent control to operate said second transmission means to thereby move said second movable means along said second guide means, said third transmission means being operatively connected between said second and third electromagnetic actuators and said embroidery frame rotating means by way of said second transmission means, said second and third electromagnetic actuators being driven to operate said third transmission means to thereby rotate said embroidery frame rotating means.

4,598,656

DEVICE FOR THE TRANSFER OF COLLANTS AND THE LIKE TO A RELEVANT SEWING MACHINE AND DRAWING DEVICE

Sergio Calamani, Segrate, and Eugenio Turri, Milan, both of Italy, assignors to Savio & C. S.p.A., Milan, Italy

Filed Jun. 14, 1983, Ser. No. 504,164
Claims priority, application Italy, Jun. 28, 1982, 22075 A/82
Int. Cl.[4] D05B 21/00
U.S. Cl. 112—121.12 3 Claims

1. A device for the transfer of tubular fabrics to a pantyhose sewing machine and for the subsequent transfer of the partially formed pantyhose for further processing, said device comprising:

(a) a frame;

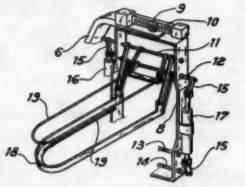
(b) first, second, third, and fourth elongate brackets mounted on said frame in side-by-side relationship to each other;

(c) first means for moving said first, second, third, and fourth elongate brackets sequentially through the following positions:

(i) a first position in which all four elongate brackets are slightly spaced apart from each other, are horizontal, and project outwardly from said frame, whereby, during use of the device, an operator can slide a first tubular element over said first and third elongate brackets and a second tubular element over said second and fourth elongate brackets; then

(ii) a second position in which said first and second elongate brackets are pressed together, whereby, during use of the device, the first and second tubular elements are both clamped between said first and second elongate brackets; then

(iii) a third position in which said third elongate bracket is



moved away from said first elongate bracket and said fourth elongate bracket is moved away from said second elongate bracket, whereby, during use of the device, the first and second tubular elements are opened wide, in which position the arms of a pantyhose sewing machine can penetrate into each tubular element, cut each tubular element at the zone between said first and second elongate brackets, and sew the first and second tubular elements to each other at the cut zone to form a partially formed panty hose; and then

(iv) a fourth position in which said first elongate bracket is moved adjacent to said third elongate bracket and said second elongate bracket is moved adjacent to said fourth elongate bracket, whereby, during use of the device, said elongate brackets hold the partially formed pantyhose well open with the waist portion of the partially formed pantyhose stretched open so that another device can enter the open waist portion of the partially formed pantyhose and slide it off said elongate brackets for further processing.

4,598,657

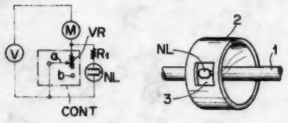
NEEDLE POSITION INDICATING DEVICE FOR A SEWING MACHINE

Hachiro Makabe, Kanagawa; Akio Koide, Tokyo; Chijyo Tachibana, Tokyo, and Kazuji Yamamoto, Tokyo, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 411,135, Aug. 24, 1982, abandoned.
This application Sep. 30, 1985, Ser. No. 782,146
Claims priority, application Japan, Aug. 27, 1981, 56-125946; Aug. 27, 1981, 56-125947; Aug. 27, 1981, 56-125948
Int. Cl.[4] D05B 69/24
U.S. Cl. 112—275 3 Claims

1. A needle position indicating device for a sewing machine having an upper drive shaft rotated to vertically reciprocate a needle bar having a needle attached to the lower end thereof, an electric motor operatively connected to the upper drive shaft to rotate the latter, and an electric circuit including at least a power supply and a manually operated controller operated in one way to connect said motor to said power supply to energize the former and operated in another way to disconnect said motor from said power supply to deenergize the former,

said needle position indicating device comprising indicating means (NL) electrically connected to said electric circuit, said indicating means being formed such as to prevent a voltage of said power supply from causing said indicating means to emit light when said controller is operated in said one way to connect said motor to said power supply, said indicating means being free to emit light with a supply of a sufficient voltage from said power supply when said controller is operated in said



another way to disconnect said motor from said power supply; and shield means (2 or 10) operated in association with said upper drive shaft so as to expose said indicating means at a predetermined angular position of said upper drive shaft when said motor is disconnected from said power supply; said predetermined angular position of said drive shaft corresponding to a predetermined position of the needle so that the position of the needle is indicated when said indicating means is exposed.

4,598,658

ARRANGEMENT FOR CONTROLLING THE SPINNAKER OF A SAIL CATAMARAN

Aldis O. Eglais, Riga, U.S.S.R., assignor to Tsarnikavsky Rybolovetsky Kolkhoz "Tsarnikava", Latviiskaya, U.S.S.R.

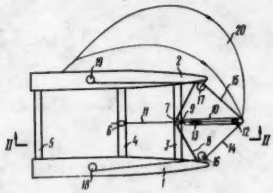
PCT No. PCT/SU84/00010, § 371 Date Nov. 27, 1984, § 102(e) Date Nov. 27, 1984, PCT Pub. No. WO84/04079, PCT Pub. Date Oct. 25, 1984

PCT Filed Mar. 7, 1984, Ser. No. 683,272

Claims priority, application U.S.S.R., Dec. 4, 1983, 3578245

Int. Cl.[4] B63H *9/04*

U.S. Cl. 114—39 **2 Claims**



1. An arrangement for controlling the spinnaker of a sail catamaran consisting of two hulls joined by beams and having a mast on one of said beams, comprising a spinnaker boom having a spinnaker, an end of a halyard and lower stays secured to the front end of said spinnaker boom, the other end of the halyard being secured to the mast and the lower stays being secured by one end to the end of the spinnaker boom and by other ends to respective stoppers, wherein the improvement comprises an upright mounted on a front beam joining the hulls mounts an upright; the spinnaker boom being hinged to the upper end of the upright; and two stays, each of which is secured by one end to the upper end of the upright and by its other end to the bow of a respective hull of the catamaran.

4,598,659

SAILBOARD WITH REMOVABLE FLOATS

Lindsay C. Chinnery, 10/16 Maple Grove, Toorak, Victoria, Australia

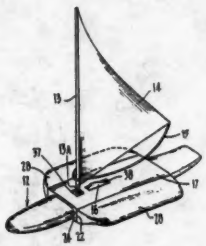
PCT No. PCT/AU83/00164, § 371 Date Jul. 11, 1984, § 102(e) Date Jul. 11, 1984, PCT Pub. No. WO84/01925, PCT Pub. Date May 24, 1984

PCT Filed Nov. 10, 1983, Ser. No. 627,994

Claims priority, application Australia, Nov. 15, 1982, PF6804; Nov. 25, 1982, PF6980; Jul. 27, 1983, PG0509

Int. Cl.[4] B63B *43/14*

U.S. Cl. 114—39 **15 Claims**



1. An accessory for a sailboard comprising a pair of relatively rigid elongated flotation members formed of synthetic plastic material, each flotation member having an inner side and a substantially flat upper surface extending from the inner side to an outer side, a sleeve to engage on the sailboard, the sleeve having opposed side edge portions and an upper web extending between the side edge portions, the side edge portions and web having a length substantially equal to the length of the inner sides of the flotation members and the side edge portions being shaped to engage side rails of the sailboard with the web closely engaging and overlying an upper surface of the sailboard, means to interconnect the side edge portions and extend across a lower surface of the sailboard to releasably secure the sleeve thereto, means to rigidly secure the side edge portions of the sleeve to respect flotation members, and the upper surfaces of the flotation members being substantially coextensive with the upper web so that, in use, the upper surface of the railboard extends across the flotation members and the flotation members and sleeve form a substantially rigid unitary structure with the sailboard with the side edge portions of the sleeve engaged with the sailboard side rails.

4,598,660

BIRD SCARING DEVICE

Peter Konzak, Box 547, Devils Lake, N. Dak. 58301

Continuation-in-part of Ser. No. 499,696, May 31, 1983, which is a continuation-in-part of Ser. No. 388,040, Jun. 14, 1982, abandoned. This application Mar. 29, 1984, Ser. No. 594,858

Int. Cl.[4] G08B *15/00*; G09F *19/08*

U.S. Cl. 116—22 A **10 Claims**

1. A bird scaring device comprising:

a frame;

visual means attached to said frame for reciprocal rectilinear movements between active and inactive positions for scaring birds; and

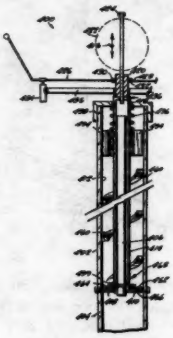
actuator means operatively connected to said visual means for moving said visual means between said inactive and active positions, said actuator means including means for ejecting a gaseous stream in a predetermined path and at increased velocity;

said visual means including target means disposed in said predetermined path so as to present a surface against which said gaseous stream impinges, said visual means moving from said inactive position and into said active

position in response to impingement of said gaseous stream upon said surface of said target means;

said visual means including motion converting means for converting linear motion of said visual means into rotary motion in response to said visual means linearly moving from said active position and into said inactive position, wherein

said motion converting means includes means defining a track to establish a spiral course in a fixed position relative to said visual means, and roller means attached to said visual means so as to be moveable therewith, said roller means engaging said track when said visual means moves



from said active position to said inactive position along said linear path and for following said spiral course established by said track to responsively translate the linear movement of said visual means into rotary movement, whereby said visual means rotates upon movement from said active position to said inactive position;

said roller means including a pair of axles each having one and other ends, said axles being pivotally mounted to said visual means at said one end thereof so as to be pivotally movable between first and second position, and rollers journalled to respective said axles at said other end thereof.

4,598,661

SAFETY SIGNAL DEVICE

Joan A. P. Roe, 1318 Sheridan Rd., Winthrop Harbor, Ill. 60096

Filed Apr. 16, 1984, Ser. No. 600,975

Int. Cl.[4] B63C *9/20*

U.S. Cl. 116—209 **14 Claims**

1. A signal device to be secured to the clothing of a wearer comprising:

telescoping flag means;

a support member defining a pocket member constructed and arranged to be connected to said telescoping flag means and to support said telescoping flag means in an upright manner, said pocket member including at least two opposing members joined together by first attachment means; and

a second attachment means operatively associated with said support member to attach and secure said support member to the clothing of a wearer, said first attachment means constructed and arranged to permit detachment of said opposing members of said support member and said second attachment means can be constructed and arranged to permit detachment of said support member from said clothing whereby when a force is exerted on said flag

means or said support member, one of said first or second attachment means can release.

4,598,662

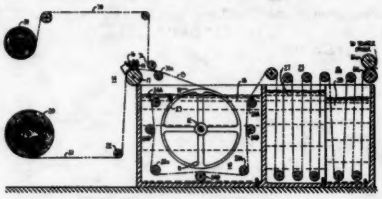
DRUM COAGULATOR FOR PREPARING MICROPOROUS MEMBRANES

William K. W. Chen, Berkeley Heights, N.J., assignor to International Microporous Technology, Inc., Sunnyvale, Calif.

Filed Feb. 11, 1983, Ser. No. 465,768

Int. Cl.[4] B05C *11/00, 11/02, 3/12*

U.S. Cl. 118—34 **14 Claims**



1. A device for producing a flexible layered article comprising:

A. means for paying out a fabric backing;

B. means for coating upon said fabric backing a solution of a polymeric material dissolved in a solvent;

C. a bath containing a liquid which is miscible with the solvent but which is a non-solvent for the polymeric material;

D. drum means which is substantially submerged within said liquid in said bath; and

E. gripping means for preventing significant dimensional shrinkage of the coated fabric backing when said coated fabric backing is in contact with the curved surface of the drum.

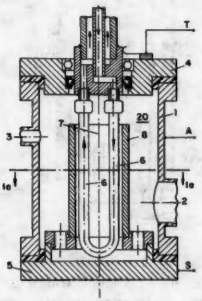
3. The device of claim 1 wherein said gripping means comprises pins embedded in the surface of said drum projecting substantially radially therefrom.

4,598,663

APPARATUS FOR TREATING THE INSIDE SURFACE OF AN ARTICLE WITH AN ELECTRIC GLOW DISCHARGE

Eberhard Moll, Triesen, Liechtenstein, and Rainer Buhl, Sargans, Switzerland, assignors to Balzers Aktiengesellschaft, Liechtenstein

Filed May 10, 1984, Ser. No. 608,971
Claims priority, application Switzerland, May 10, 1983, 2544/83
Int. Cl.[4] S05D *3/14*
U.S. Cl. 118—50.1 9 Claims



1. An apparatus for treating the inside surface of an electrically conductive article such a tubular article by means of an electric glow discharge utilizing a hollow cathode effect for producing a glow discharge, comprising:

(a) a housing defining a vacuum chamber including a cylindrical portion, a first cover connected to and electrically insulated from said cylindrical portion and forming a support for supporting the tubular article and a second cover connected to and electrically insulated from said cylindrical portion and having at least a part bounding the chamber which may be electrically conductive;

(b) an electrically conductive fluid cooled auxiliary electrode located to extend within the vacuum chamber said electrically conductive auxiliary electrode being in the form of a U-shaped hollow tube having a first leg and a second leg and said auxiliary electrode including passages for supplyingcoolant whereby, coolant is directed into the first leg of the U-shaped hollow tube flows through the U-shaped hollow tube and exits the second leg of the U-shaped hollow tube;

(c) electrically conductive support means, connected to and in electrical contact with said second cover, for supporting the electrically conductive tubular article in the vacuum chamber for creating an electrical contact with the tubular article, the article having a central axis and an interior wall, and for supporting the tubular article so that said auxiliary electrode extends into the article so that said first leg and said second leg of said auxiliary electrode are positioned near to but spaced from the interior wall and spaced from the central axis the electrical contact with said electrically conductive support means forming an anode electrode; and,

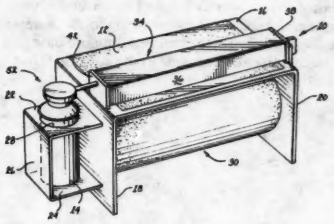
(d) circuit means electrically connected to said electrically conductive chamber said auxiliary electrode and said support means for applying potential thereto to form an electric glow discharge mainly between the inner wall of the electrically conductive tubular article and said auxiliary electrode in the interior of the electrically conductive tubular article.

4,598,664

DISPENSING APPARATUS

Jerry F. Hamlin, 874 Shirley La., Boulder City, Nev. 89005

Filed Mar. 7, 1985, Ser. No. 709,517
Int. Cl.[4] B05B *15/12*
U.S. Cl. 118—325 17 Claims



1. A dispensing apparatus for impregnating paper unrolled from a roll of paper with a substance, comprising:

two leg members supporting said roll of paper;

a top member supported by said two leg members;

aerosol spreading means located on top of said top member for distributing said substances uniformly across said paper, said aerosol spreading means comprises an elongated member having a generally u-shaped transverse cross-section, a top side, a front side, a back side and two end sides to allow a continuous impregnation substantially along the entirety of a desired portion of said paper; and

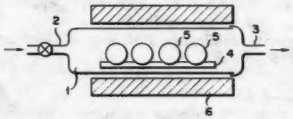
support means attached to one of said two leg members for holding a means for introducing said substance into said spreading means.

4,598,665

SILICON CARBIDE PROCESS TUBE FOR SEMICONDUCTOR WAFERS

Takashi Tanaka, and Shigeru Abe, both of Yamagata, Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan

Filed Dec. 24, 1984, Ser. No. 685,794
Claims priority, application Japan, Dec. 26, 1983, 58-251857
Int. Cl.[4] C23C *16/00*
U.S. Cl. 118—715 2 Claims



1. A process tube made wholly of silicon carbide, comprising a reaction gas inlet port, a reaction gas outlet port, and a central area therebetween defined by the inner circumference of said tube whereat semiconductor wafers may be arranged for heat treatment processing, wherein the surface of said inner circumference has a coarseness of, at most, 150 microns.

4,598,666

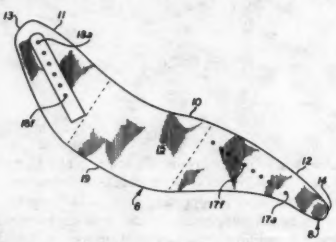
FELINE PROTECTIVE GARMENT

Jacob E. Spanko, 3-H Chatham Center Apts., Pittsburgh, Pa. 15219, assignor to Jacob E. Spanko, Pittsburgh, Pa.

Filed Dec. 21, 1984, Ser. No. 684,804
Int. Cl.[4] A01K *27/00, 29/00*
U.S. Cl. 119—106 3 Claims

1. Neck garment for a female cat adapted to deter its impregnation by males while being worn and capable of being worn during all other normal feline activities, comprising:

a. an integral band adapted to be wrapped around and span a feline neck without noticeably restricting its mobility and further presenting a texture sufficiently smooth to preclude a male cat from coupling by obtaining a normal grip on the upper neck of the female cat by the teeth as is normally required to accomplish copulation, said band having an external surface comprising a flexible sheet of an elastomeric material bonded to an underlying fabric-like integral band, said sheet being of a dimension and durability sufficient to permit its trimming along its posterior edge to size the garment to the specific feline neck to be outfitted; and



b. a first and second elongated band segment connected to extent in opposite directions from the lateral edges of said integral band and being of length sufficient to partially overlap one another, each of said segments having a free end and a substantially flat inner and outer surface, and an attachment means adapted to permit the inner surface of one segment to be interruptably secured to the outer surface of the other segment, whereby the assembled garment forms a hollow collar shaped like a conical frustrum that conforms to the cervical contour while in close proximity to the feline neck.

4,598,667

COOLED TUBE WALL FOR METALLURGICAL FURNACE

Herbert Kuhlmann, Bochum, and Kurt Rieger, Bottrop, both of Fed. Rep. of Germany, assignors to Fried. Krupp GmbH, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 602,323, Apr. 20, 1984, abandoned, which is a continuation-in-part of Ser. No. 378,250, May 14, 1982, Pat. No. 4,453,500. This application Sep. 30, 1985, Ser. No. 782,603

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1982, 3202574

Int. Cl.[4] F22B *37/24*

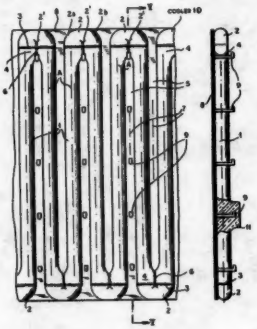
U.S. Cl. 122—6 A 2 Claims

1. A tube wall for a metallurgical furnace said wall comprising:

an array of generally parallel cylindrical tubes centered on respective tube axes and each having two widened axially open tube ends of oval cross section one of which projects laterally from the respective tube in one radial direction and the other of which projects laterally from the respective tube in the opposite radial direction, each oval tube end laterally engaging the oppositely projecting oval tube end of an adjacent tube along a common tangent, said adjacent tubes being laterally spaced between their engaging ends;

respective caps each covering two adjacent tube ends and interconnecting same, whereby the interiors of said tubes and caps form a sinuous passage, saids caps being indented and having oval tubular portions registering with the oval cross section tube ends covered thereby, said adjacent tubes being laterally spaced between their engaging ends;

respective caps each covering two adjacent tube ends and interconnecting same, whereby the interiors of said tubes and caps form a sinuous passage, said caps being indented and having oval tubular portions registering with the oval cross section tube ends covered thereby, said welds including a U-shaped weld seam extending along opposite sides of each tangent to weld the laterally engaging tube ends together and a peripheral planar weld extending between the periphery of each cap and the respective tube ends, the U-shaped weld of each cap being perpendicular to the planar weld thereof; and



means for circulating a coolant through said array, said caps being rounded and forming smooth continuations of the respective tube ends, said caps being of greater wall thickness than said tubes, said array being upright and received in a support wall provided with anchors engaging said tubes generally at the welds between said tube ends and wholly supporting said array, said anchors being hooks engaged up underneath the upper caps; and

a lining of refractory material suspended by said anchors from said support wall.

4,598,668

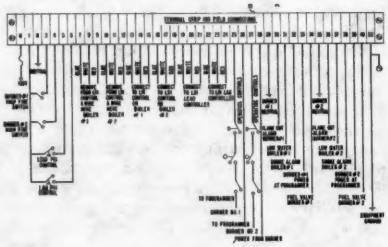
APPARATUS FOR EFFICIENTLY CONTROLLING THE OPERATION OF PARALLEL BOILER UNITS

Lawrence M. Bader, Peekskill, N.Y., assignor to Energy Systems and Service Corp., Peekskill, N.Y.

Filed Jan. 9, 1985, Ser. No. 690,112

Int. Cl.[4] F22B *37/42*; F22D *5/36*

U.S. Cl. 122—448 B 10 Claims



1. Control apparatus for selecting any one of a plurality of parallel boiler units to serve as a lead boiler, with the others in said plurality operating as lag boilers, with each of said boilers capable of providing outputs indicative of a failure mode, and with each of said boilers capable of providing a modulation of operation between a lead pressure value and a lag pressure value, based on an internal program individual control of each boiler, comprising:

first selection means for selecting any one of said plurality of boilers to operate as said lead boiler,

lead pressure means responsive to said selected boiler for monitoring the lead pessure output of said selected boiler to determine operation in an accepable range,

selectively operated means responsive to said first selection means to enable at least one other boiler in said plurality to operate as a lag boiler when selected,

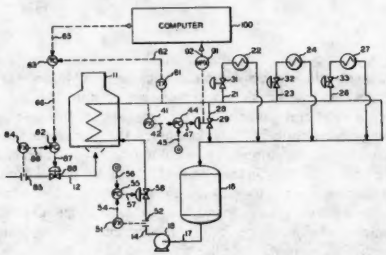
timing means responsive to said monitored lead pressure and coupled to said selectively operated means to cause said means to operate after a given period of operation of said lead boiler at said lead pressure, whereby said lag boiler is selected to aid said lead boiler in operation even though said monitored pressure is within said acceptable range.

4,598,669

CONTROL OF A SYSTEM FOR SUPPLYING HEAT

Gary L. Funk, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 26, 1985, Ser. No. 705,828
Int. Cl.[4] F02M *41/00;* G06G *7/57*
U.S. Cl. 122—448 R 18 Claims



1. Apparatus comprising:

a furnace having a fluid inlet and a fluid outlet;

a hot fluid header for passing a fluid stream from the fluid inlet of said furnace through said furnace and from the fluid outlet of said furnace as a heating fluid to at least first and second processes;

means for supplying a fuel to said furnace, wherein the combustion of said fuel in a combustion zone in said furnace supplies heat to said fluid stream;

means for bypassing a portion of said fluid stream from the fluid outlet of said furnace around said first and second processes to the fluid inlet of said furnace;

a first control valve operably located so as to control the bypassing of said fluid stream through said means for bypassing;

means for establishing a first signal representative of the actual position of said first control valve;

means for establishing a second signal representative of the desired position of said first control valve;

means for establishing a third signal representative of the temperature of the fluid stream exiting said furnace required to maintain the actual position of said first control valve substantially equal to the desired position represented by said second signal in response to said first and second signals;

means for establishing a fourth signal representative of the actual temperature of said fluid stream exiting said furnace;

means for comparing said third signal and said fourth signal and for establishing a fifth signal which is responsive to the difference between said third signal and said fourth signal, wherein said fifth signal is scaled so as to representative of the flow rate of said fuel to said furnace required to maintain the actual exit temperature of said fluid stream substantially equal to the desired exit temperature represented by said third signal; and

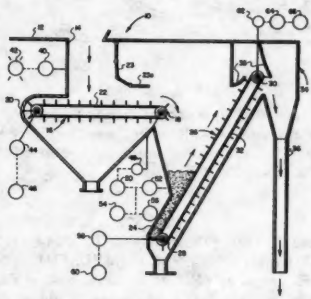
means for manipulating the flow of said fuel to said furnace in response to said fifth signal.

4,598,670

SOLID FUEL FEED SYSTEM FOR A BOILER

Christian J. Clamser, Whippany, and Robert A. Powers, Mountainside, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jul. 3, 1985, Ser. No. 751,645
Int. Cl.[4] F22B *38/42;* F23K *3/00*
U.S. Cl. 122—449 3 Claims



1. A fuel system for a boiler comprising inlet means for receiving said fuel, hopper means for storing said fuel, discharge means for discharging fuel to said boiler, first conveyor belt means extending between said inlet means and said hopper means and constructed and arranged for receiving said fuel from said inlet means and conveying said fuel to said hopper means, second conveyor belt means extending between said hopper means and said discharge means, a portion of said second conveyor means extending within said hopper means for receiving the accumulated fuel in said hopper means, said second conveyor means being constructed and arranged to transfer said fuel from said hopper means to said discharge means, first control means for controlling the speed of said first conveyor belt means in response to the amount of fuel in said hopper means, second control means responsive to the operation of said boiler for controlling the speed of said second conveyor belt means, sensing means for sensing the speed of each of said conveyor belts, alarm means connected to said sensing means for providing an alarm in response to the speed of said conveyor belt means falling below or above a predetermined value, and means associated with each of said conveyor belt means for controlling the level of said fuel on said belt means.

4,598,671

VENTILATING SYSTEM ON AN INTERNAL-COMBUSTION ENGINE

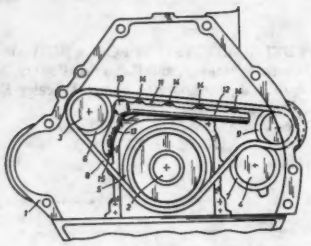
Roland Glück, Ludwigsburg; Otto Heilemann, Wernau, and Günter Bartsch, Schorndorf, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed May 20, 1985, Ser. No. 735,577
Claims priority, application Fed. Rep. of Germany, May 24, 1984, 3419368
Int. Cl.[4] F01P *1/06;* F02B *75/06*
U.S. Cl. 123—41.31 12 Claims

1. A ventilating system on an internal-combustion engine of the type having balancer shafts for a balancing of mass of the second degree are arranged at an engine crankcase with the end of the crankshaft located in a clutch housing, the balancer

shafts being in driving connection with the crankshaft by means of a toothed belt, said ventilating system comprising:

an inlet opening for the conveying of fresh air into the clutch housing, and



an air guiding duct means connecting to the inlet opening, and having at least one outlet opening in the direct area of the toothed belt for directing fresh air in a targeted manner out onto the toothed belt.

4,598,672

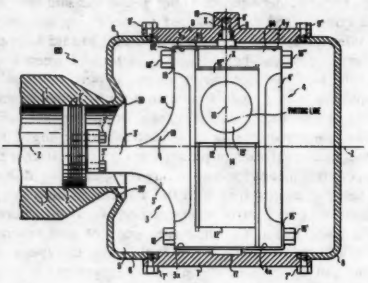
APPARATUS FOR STABILIZING THE POSITION OF A YOKE IN AN INTERNAL COMBUSTION ENGINE

Michael E. Jayne, and Robert B. Gray, both of Belchertown, Mass., assignors to R P & M Engines, Amherst, Mass.

Continuation-in-part of Ser. No. 614,475, May 29, 1984, abandoned. This application Feb. 6, 1985, Ser. No. 699,217

Int. Cl.[4] F02B 75/28

U.S. Cl. 123—56 BC 32 Claims



1. Apparatus for an internal combustion engine having a pressure source for generating pressure in response to operation of said engine and having at least one cylinder with a first longitudinal axis and having a yoke with a slot having a second axis substantially orthogonal to the first axis comprising

first bearing means mounted to the crankcase and engaging at least one first surface of the yoke for stabilizing the position of the yoke for movement parallel to said first axis, the second axis during movement of the yoke along the first axis intersecting the means mounted to the crankcase and

a second bearing means movably received in and extending from the crankcase, said second bearing means through its range of movement engaging and applying a force to a second surface on the yoke opposite the first surface in response to said pressure received by said second bearing means from said pressure source, said source comprising means responsive to a lubricant pressure generated by the internal combustion engine to generate the force applied to the second surface of the yoke.

4,598,673

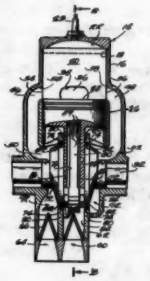
AIR-SCAVENGED TWO-CYCLE INTERNAL COMBUSTION ENGINE

Arthur G. Poehlman, West Bend, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 6, 1985, Ser. No. 698,884

Int. Cl.[4] F02B 33/04

U.S. Cl. 123—73 PP 12 Claims



1. A two-cycle internal combustion engine comprising a crankcase including a rotatable crankshaft, a cylinder extending from said crankcase and including a combustion chamber having a head end, an exhaust port in said cylinder communicating with said combustion chamber, a fuel intake port in said cylinder communicating with said combustion chamber, an air intake port in said cylinder communicating with said combustion chamber at a location closer to said exhaust port than said fuel intake port, a piston operably connected to said crankshaft and mounted for reciprocative movement in said cylinder through a compression stroke to cover all of said ports and through an expansion stroke to uncover all of said ports, an air inlet in said crankcase, a fuel inlet in said crankcase, dividing means located interiorly of said crankcase and defining an air crankcase portion which communicates with said crankcase air inlet and with said air intake port and further defining a separate fuel crankcase portion which communicates with said crankcase fuel inlet and with said fuel intake port, means for admitting a fuel-air mixture into said crankcase fuel inlet, and means for admitting air into said crankcase air inlet.

4,598,674

ROCKER ARM SPRING FOR A VALVE ACTUATING MECHANISM OF AN INTERNAL COMBUSTION ENGINE

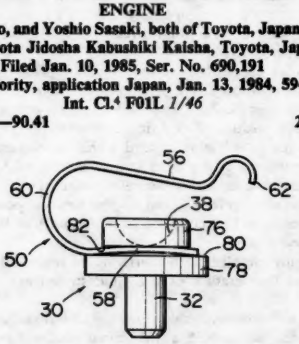
Yasushi Nono, and Yoshio Sasaki, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 10, 1985, Ser. No. 690,191

Claims priority, application Japan, Jan. 13, 1984, 59-3550

Int. Cl.[4] F01L 1/46

U.S. Cl. 123—90.41 2 Claims



1. A rocker arm spring for use in a valve actuating mechanism of an internal combustion engine having a cylinder head,

an overhead camshaft mounted on the cylinder head and a valve having a valve stem extending through the cylinder head, the valve actuating mechanism including a rocker arm having a first end and a second end, a universal pivot swingably supporting the first end of the rocker arm on the cylinder head of the engine, the second end of said rocker arm being in contact with the valve stem, and a cam on the overhead camshaft engaging from above a portion of said rocker arm intermediate said first and second ends to cause said rocker arm to swing about said universal pivot, the universal pivot including a support socket mounted on said cylinder head, the support socket having a part-spherical concave bearing surface and a circumferential groove with a fixed predetermined groove width, and a pivotable shaft mounted on the first end of the rocker arm, the pivotable shaft having a part-spherical convex lower end mating with and received in said concave bearing surface, and said rocker arm spring being in the form of a leaf spring made of an elongated strip of resilient material thinner than the predetermined groove width, the strip being bent to a substantially U-shape having an upper arm and a lower arm, said lower arm having a forked end engageable within the circumferential groove in said support socket, said upper arm being engageable with said rocker arm for urging said lower end of the pivotable shaft into contact with said bearing surface of the support socket as well as for biasing the second end of the rocker arm into contact with said valve stem, wherein the improvement comprises:

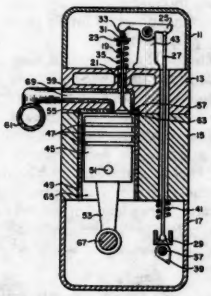
said lower arm of the rocker arm spring being warped from a flat plane so as to contact snugly and resiliently one side of said circumferential groove of the support socket at two spaced apart locations and the opposite side of said groove at a single location intermediate said two spaced apart locations when said forked end is engaged within said circumferential groove.

4,598,675

COMPONENTS FOR INTERNAL COMBUSTION ENGINES

William D. Long, Tonawanda, N.Y., assignor to Kennecott Corporation, Cleveland, Ohio

Division of Ser. No. 224,239, Jan. 12, 1981, abandoned. This application Apr. 15, 1983, Ser. No. 483,447
Int. Cl.⁴ F01L *1/14*
U.S. Cl. 123—90.51 **1 Claim**



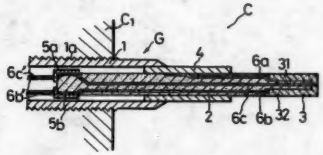
1. In an internal combustion engine having a cylinder head and a cylinder block, a valve assembly comprised of a plurality of valve guides mounted within said cylinder head, a plurality of valves with valve stems positioned within and movable through said valve guides, a plurality of valve spring retainer rings positioned adjacent the stem ends of said valves, a plurality of rocker arms adapted to move said valves within said valve guides, a plurality of push rods adapted to engage said rocker arms at one end, and having tappets positioned adjacent the opposite end, said tappets adapted to engage and be reciprocally moved by a cam, a power assembly comprised of a plurality of pistons having piston rings thereon and adapted to be received within cylinder liners, positioned within said cylinder block, a plurality of piston pins movably attached within each piston to a connecting rod, a plurality of flame plates, valve seats and exhaust port liners positioned within said cylinder head and an exhaust manifold positioned adjacent said cylinder head, the improvement which comprises the tappets being fabricated entirely from sintered silicon carbide.

4,598,676

GLOW PLUG FOR AN INTERNAL COMBUSTION ENGINE

Novuei Ito, Nukata; Kinya Atsumi, Toyohashi; Naohito Mizuno, Okazaki, and Tetsuro Kikuchi, Nishio, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 15, 1984, Ser. No. 580,182
Claims priority, application Japan, Feb. 18, 1983, 58-26754
Int. Cl.⁴ F02N *17/00*
U.S. Cl. 123—145 A **8 Claims**



1. A glow plug mounted in a combustion chamber of an internal combustion engine, comprising:

(1) a heater support member projecting into the combustion chamber of the internal combustion engine, said heater support member being formed of a mixture containing alumina and silicon nitride;

(2) a heater member affixed to the surface of said heater support member, said heater member being formed of a mixture containing molybdenum disilicate and silicon nitride, said heater support member and said heater member being integrally sintered;

said heater support member being in the form of a rod, and said heater member covering in a U-shaped form the tip end face of said heater support member and the upper and lower face portions of said heater support member contiguous to said end face;

(3) first, second and third lead wires for power supply embedded in said heater support member;

one end of said first lead wire being connected embeddedly to one end portion of said heater member, one end of said second lead wire being connected embeddedly to the other end portion of said heater member and one end of said third lead wire being connected embeddedly to the central portion of said heater member, thereby forming two heater elements having substantially the same resistance value between the lead wires;

(4) a power source; and

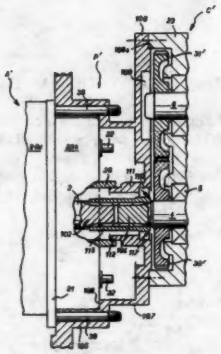
(5) a power switching means for connecting said power source selectively between said lead wires for power supply according to the state of preheating in said combustion chamber, said power switching means having a switching relay contact for connecting said power source selectively between said third lead wire and the other two lead wires and between said other two lead wires.

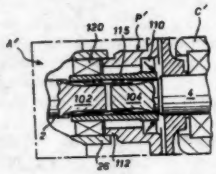
4,598,677

ARRANGEMENT OF AUXILIARY EQUIPMENT UNITS FOR INTERNAL COMBUSTION ENGINED AUTOMOTIVE VEHICLES

Michel Mongin, Saint-Germain-en-Laye, and Michel Jaccod, Champigny-sur-Marne, both of France, assignors to Valeo, Paris, France

Filed Jul. 19, 1984, Ser. No. 632,588
Claims priority, application France, Jul. 22, 1983, 83 12178
Int. Cl.[4] F02F 7/00; B25G 3/28
U.S. Cl. 123—195 A 8 Claims





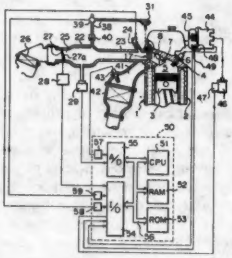
1. In a vehicle comprising an internal combustion engine for said vehicle having an engine housing, an arrangement of auxiliary equipment units for said internal combustion engine comprising an alternator including an alternator shaft journalled in an alternator casing, a compressor coaxial with said alternator and including a separate compressor shaft journalled in a compressor casing, an intermediate part fixing said alternator casing and said compressor casing together and to said engine housing, said alternator shaft and said compressor shaft being substantially axially aligned, and common drive means for driving said alternator and said compressor in rotation at the same speed from said engine comprising a coupling sleeve and wherein said alternator shaft and said compressor shaft have facing ends which are coupled together in rotation by said coupling sleeve, said facing ends of said alternator and compressor shafts are formed with axial splines and said coupling sleeve has axial internal splines cooperating with said splines on said shafts, wherein said coupling sleeve is mounted with play on said alternator shaft splines and further comprising a sleeve on said alternator casing into which said coupling sleeve extends, and a bearing by means of which said coupling sleeve is centered in said sleeve of said casing.

4,598,678

INTAKE SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Nobuyuki Kobayashi, and Toshimitsu Ito, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 1, 1985, Ser. No. 729,461
Claims priority, application Japan, May 7, 1984, 59-089234
Int. Cl.[4] F02F 1/42; F02M 51/00
U.S. Cl. 123—306 15 Claims



1. An internal combustion engine comprising:
an intake passage;
a swirl control valve arranged in said intake passage for creating a swirl motion in a combustion chamber when said swirl control valve is closed;
an actuator having a vacuum chamber isolated from the outside air by a diaphragm which is connected to said swirl control valve, said actuator closing said swirl control valve when the level of vacuum in said vacuum chamber becomes greater than a predetermined level;
valve means arranged between said intake passage and said vacuum chamber for confining vacuum in said vacuum chamber to close said swirl control valve when said engine is operating at a low speed, said valve means causing said vacuum chamber to open to the outside air for opening said swirl control valve when said engine is operating at a high speed;
fuel supply means arranged in said intake passage for forming a lean air-fuel mixture therein;
a vacuum sensor arranged in said intake passage for detecting the absolute pressure therein;
means for calculating an elapsed time after said absolute pressure exceeds a predetermined pressure under a state where said engine is operating at a low speed; and
control means controlling said valve means and said fuel supply means for causing said vacuum chamber to open to the outside air to open said swirl control valve and for changing an air-fuel mixture formed by said fuel supply means to an air-fuel mixture of an approximately stoichiometric air-fuel ratio from a lean air-fuel mixture when said elapsed time exceeds a predetermined time.

4,598,679

FUEL CONTROL SYSTEM FOR A VEHICLE POWERED BY AN ENGINE

Hiroya Ohkumo, Koganei, and Tsutomu Murakawa, Mitaka, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1985, Ser. No. 733,023
Claims priority, application Japan, May 23, 1984, 59-105453
Int. Cl.[4] F02D 41/12
U.S. Cl. 123—325 6 Claims

1. In a fuel control system for a vehicle powered by an engine having an ignition device, the vehicle having a transmission, a clutch disposed between the engine and the transmission for transmitting the power of the engine to driving

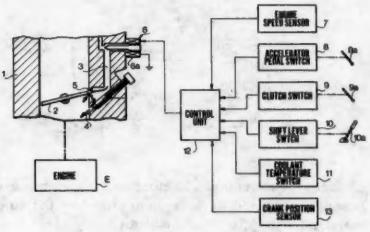
wheels of the vehicle, and an accelerator pedal for accelerating the vehicle, the improvement comprising:

fuel cut off means for cutting off fuel supplied to cylinders of the engine;

a first sensor responsive to operation of the accelerator pedal for producing an output signal;

an engine speed sensor for producing an engine speed signal in accordance with engine speed;

first means responsive to the engine speed signal for producing first engine speed signal when the engine speed is higher than a first predetermined speed and for producing a second engine speed signal when the engine speed is lower than a second predetermined speed;



second means responsive to the output signal of the first sensor and the first engine speed signal at releasing of the accelerator pedal for producing a fuel cut off signal for operating the fuel cut off means;

third means responsive to an inverted signal of the first engine speed signal for intermittently operating the fuel cut off means so as to intermittently supplying the fuel; and

fourth means responsive to the second engine speed signal for disabling the fuel cut off means so as to continuously supply the fuel to cylinders of the engine.

4,598,680

METHOD AND APPARATUS FOR OPTIMIZING A CONTROLLABLE ADJUSTMENT PARAMETER OF A CYCLICALLY OPERATING MACHINE, PARTICULARLY AN INTERNAL COMBUSTION ENGINE

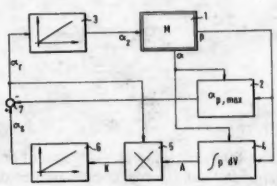
Hermann Lanfer, Illigen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 12, 1985, Ser. No. 775,124

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1984, 3435254

Int. Cl.⁴ F02P *5/04*

U.S. Cl. 123—425 **6 Claims**



1. Method of optimizing the control of the ignition timing of an internal combustion engine comprising the steps of:

selecting a measurable optimization parameter (A) for said engine;

selecting a measurable operating parameter ($\alpha_{p,max}$) related to said optimization parameter and to said controllable parameter and derivable in a manner utilizing at least one sensor for detecting the behavior of said machine;

computing said measurable operating parameter ($\alpha_{p,max}$) for each ignition cycle of said engine and comparing it with a correctable reference value thereof to produce an error signal (α_p);

detecting behavior of said engine by means of said sensor and computing the value of said optimization parameter (A) with use of the output of said sensor for each ignition cycle of said engine;

multiplying the computed value of said optimization parameter (A) by the value of said error signal (α_r) to produce a correlation signal (K);

producing said correctable reference value by the output of an integrating controller (6) supplied with said correlation signal (K) for its input;

correcting said reference value between successive ignition cycles of said engine by means of said integrating controller (6) by shifting the magnitude of said reference signal at the output of said controller in the direction having the great probability of change towards zero by producing in said integrated controller (6) a signal representative of the average of said correlation signal (K) and previous values of said correlation signal produced in previous ignition cycles of said engine, and

controlling said controllable operating parameter (α_z) by the output of a controller supplied with said error signal (α_r) for its input.

4,598,681

AUTOMOTIVE ENGINE WITH KNOCK SENSOR

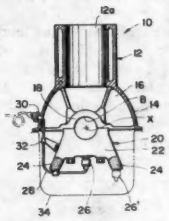
Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 411,048, Aug. 24, 1982, abandoned. This application Mar. 22, 1985, Ser. No. 714,358

Claims priority, application Japan, Aug. 26, 1981, 56-132568

Int. Cl.⁴ F02P *17/00;* **G01L** *23/22*

U.S. Cl. 123—425 **7 Claims**



1. An automotive internal combustion engine comprising:

a cylinder block having a bottom part with a plurality of main bearings;

a bearing beam structure secured to the bottom part of said cylinder block and including a plurality of main bearing cap sections which associate with said main bearings of said cylinder block to rotatably support a crankshaft, and at least one beam section for securely connecting said bearing cap sections with each other; and

an engine knock sensor for detecting engine knock, said knock sensor being located on a part of said bearing beam structure.

4,598,682

METHOD OF CONTROLLING AIR-FUEL RATIO OF AN ENGINE

Takashi Miyano, Kanagawa, Japan, and Takashi Miyano, Kanagawa, Japan, assignors to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1984, Ser. No. 667,885

Int. Cl.⁴ F02B *3/00*

U.S. Cl. 123—440 **5 Claims**

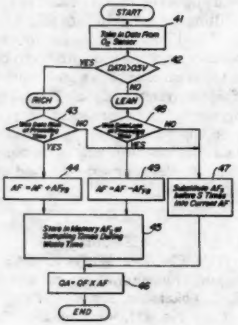
1. A method of controlling the air-fuel ratio in an internal combustion engine having an oxygen sensor mounted on the

engine at the exhaust, wherein the concentration of oxygen in the exhaust gases from the engine is sampled and detected by the oxygen sensor in synchronism with the rotational speed of the engine to obtain an electrical voltage signal corresponding thereto, thereafter controlling the air-fuel ratio in accordance with the detected result in the case of detecting a change in the air-fuel ratio, the method comprising the steps of:

taking a series of sample results from the oxygen sensor in synchronism with the rotational speed of the engine,

comparing each latest sampled result with the sampled result at the preceding sampling time,

calculating a correction factor of an integral gain at every rotation of the engine when the sampled result at current



sampling time and the sampled result at the preceding sampling time are equal to each other,

storing respective correction factors thus calculated retroactive to the sampling times corresponding to a waste time period of an engine system,

applying the correction factor of the integral gain from the storing step when the sampled result at current sampling time and the sampled result at the preceding sampling time are not equal to each other,

calculating an air amount by directly using the applied correction factor, and

sending air to the engine in accordance with the newly calculated air amount.

4,598,683

FUEL INJECTION PUMP OF THE DISTRIBUTION TYPE

Toshihiko Ohmori, Nagoya; Sinya Sumitani, Anjo; Takio Tani, Kariya; Masahiko Miyaki, Oobu, and Akira Masuda, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 12, 1985, Ser. No. 711,060

Claims priority, application Japan, Mar. 15, 1984, 59-49663; Mar. 15, 1984, 59-49665

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—450 **16 Claims**

1. A distribution type fuel injection pump for delivering fuel to each of the combustion chambers in an internal combustion engine comprising:

pump housing means including a pumping head in which a pumping chamber is defined;

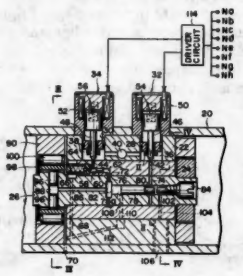
first fuel supply means for supplying fuel to the pumping chamber;

fuel pressurizing means for applying pressure to the fuel in the pumping chamber;

distributor means for distributing and delivering the fuel, which has been pressurized in the pumping chamber, to each of the combustion chambers in the engine;

control plunger means actuated by the fuel pressure in the pumping chamber and including a control cylinder bore defined in the pumping head and a control plunger fitted into the control cylinder bore, the control cylinder bore being partitioned into a first chamber to which the fuel pressure in the pumping chamber is transmitted and which serves to apply this pressure to one end of the control plunger, and a second chamber defined by the other end of the control plunger;

second fuel supply means for supplying an adjusted amount



of fuel to the second chamber and including a control passage connected to the second chamber and an electromagnetic valve for opening and closing the control passage; and

escaping means for allowing the fuel to escape from the second chamber when the fuel pressure in the second chamber becomes higher than a certain value.

4,598,684

APPARATUS FOR CONTROLLING AIR/FUEL RATIO FOR INTERNAL COMBUSTION ENGINE

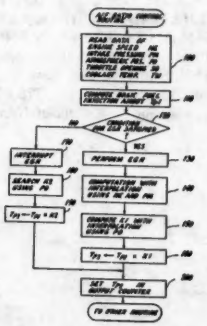
Katsushi Kato, Kariya, and Toshiaki Mizuno, Nagoya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 20, 1985, Ser. No. 746,789

Claims priority, application Japan, Jun. 22, 1984, 59-129566

Int. Cl.[4] F02M *51/00, 25/06*

U.S. Cl. 123—478 **6 Claims**



1. Apparatus for controlling air-fuel ratio of an air-fuel mixture to be supplied to an internal combustion engine having an intake passage, an exhaust passage, and an exhaust gas recirculation passage for recirculating exhaust gasses in said exhaust passage to said intake passage therethrough, said apparatus comprising:

(a) means for sensing rotational speed of said engine;

(b) means for sensing intake pressure in said intake passage;

(c) means for sensing atmospheric pressure;

(d) means for enabling and disabling exhaust gas recirculation through said exhaust gas recirculation passage in accordance with operating condition of said engine;

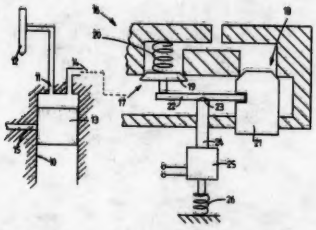
(e) means for determining required amount of fuel in accordance with said sensed rotational speed and said sensed intake pressure;
(f) means for determining, when the exhaust gas recirculation is enabled, a first correction value in accordance with said sensed rotational speed, said sensed intake pressure and said sensed atmospheric pressure, said first correction factor being used for correcting fuel amount so as to compensate for the decrease of fuel due to the performance of exhaust gas recirculation and also to compensate for the change in atmospheric pressure;
(g) means for determining, when the exhaust gas recirculation is disabled, a second correction value in accordance with said atmospheric pressure, said second correction factor being used so as to compensate for the change in atmospheric pressure;
(h) means for correcting said required amount of fuel by said first correction value and said second correction value when the exhaust gas recirculation is enabled and disabled respectively; and
(i) means for supplying said engine with said corrected amount of fuel.

4,598,685

FUEL PUMPING APPARATUS

Frank M. Logie, London, and Ronald Phillips, Northolt, both of England, assignors to Lucas Industries public limited company, Birmingham, England

Filed Jul. 10, 1985, Ser. No. 753,373
Claims priority, application United Kingdom, Jul. 13, 1984, 8417840
Int. Cl.[4] F02M 39/00; F16K 11/04
U.S. Cl. 123—506 **3 Claims**



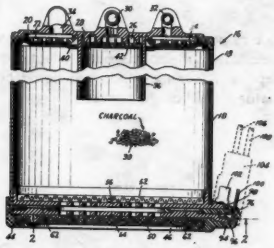
1. A fuel pumping apparatus for supplying fuel to an internal combustion engine comprising a plunger reciprocable within a bore, an outlet which in use is connected to the bore at least during the time the plunger is moved inwardly to displace fuel from the bore, said outlet in use being connected to a fuel injection nozzle of the associated engine, means through which fuel can be supplied to the bore and valve means operable during inward movement of the plunger to allow fuel to escape from the bore thereby to control the amount of fuel flowing through said outlet, said valve means comprising a first valve having a valve element which in the closed position of the valve is subjected to the pressure in the bore to hold the valve closed, a second valve having a valve element which in the closed position of the valve is subjected to the pressure in the bore to open the valve, a pivotal beam interconnecting the valve elements of the two valves, a pivot for the beam, said pivot being positioned intermediate the points of contact of the beam with the valve elements, an electromagnetic actuator which when energized moves the pivot in a direction of movement substantially parallel to the axes of movement of the valve elements and in the direction of valve closure and resilient means biasing the valve element of the first valve to the open position, the arrangement being such that in the de-energized condition of the actuator the resilient means will hold the second valve closed and the first valve open and when the actuator is energized the first valve will be closed to prevent fuel escaping from the bore, the increasing pressure within the bore as the valve closes assisting closure of the valve, and the actuator maintaining the second valve closed and when the actuator is de-energized, the second valve will open under the action of fuel pressure to permit fuel to escape from the bore.

4,598,686

FUEL VAPOR RECOVERY SYSTEM FOR AUTOMOTIVE VEHICLES

Peter J. Lupoli, Hamden; Donald J. Mattis, Norwalk, and Robert S. Miller, Stratford, all of Conn., assignors to Casco Products Inc., Bridgeport, Conn.

Filed Mar. 28, 1985, Ser. No. 717,515
Int. Cl.[4] F02M 33/02, 31/12
U.S. Cl. 123—519 **38 Claims**



1. In an internal combustion engine, in combination:
(a) a fuel system comprising a fuel intake device for supplying a combustible vapor mixture to the engine,
(b) a canister and means connecting the same to said fuel system of the engine to receive vapors therefrom,
(c) an adsorptive material in the canister for adsorbing vapors that are brought therein,
(d) heating means carried by the canister, for heating said adsorptive material to enhance the release of said vapors,
(e) means connecting said canister to the fuel intake device to deliver thereto vapors recovered from said adsorptive material, and
(f) a grid in said canister, said grid comprising large surface areas and being constituted of good heat conductive material disposed in heat transferring relation with said heating means and with said adsorptive material.

4,598,687

INTERCOOLER FOR SUPERCHARGED INTERNAL COMBUSTION ENGINE

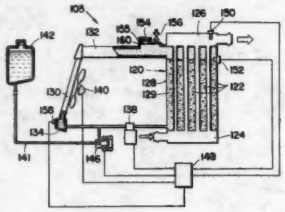
Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 5, 1984, Ser. No. 657,954
Claims priority, application Japan, Oct. 26, 1983, 58-200361
Int. Cl.[4] F02B 29/04
U.S. Cl. 123—563 **7 Claims**

1. In an internal combustion engine having a combustion chamber:
an induction passage leading to said combustion chamber;
a supercharger for discharging air under pressure into said induction passage; and
an intercooler associated with said induction passage for cooling the air discharged by said supercharger, said intercooler comprising:
a conduit through which the air from said supercharger passes;
a coolant jacket disposed about said conduit, said coolant jacket including means for receiving coolant in its liquid form and for discharging coolant in its gaseous form;

a radiator in fluid communication with said coolant jacket for receiving said coolant in its gaseous form and condensing same to its liquid form;

a sensor for sensing the temperature of the air emitted from said conduit;



a device responsive to said sensor for controlling the rate of condensation of said gaseous coolant in said radiator; and

a pump for returning condensed liquid coolant from said radiator to said coolant jacket.

4,598,688

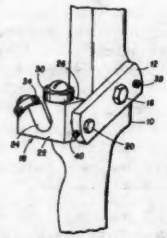
ARROW REST FOR BOWS

Lawrence L. Paul, 206 Knotty Circle Dr., and Robert L. Glaspie, 700 N. Columbus, both of West Liberty, Iowa 52776

Filed Sep. 30, 1982, Ser. No. 429,301

Int. Cl.[3] F41B 5/00

U.S. Cl. 124—41 A **8 Claims**



1. An arrow rest for use in connection with a bow, said arrow rest comprising a mounting member having a forward end and a rear end for mounting the arrow rest on a bow, a fastening member for removably securing the mounting member to a bow, said mounting member having an opening extending through it to receive the fastening member and to secure the mounting member to a bow at a selected angle, a carrier pivotally connected to the mounting member at its rearward end, means for holding the carrier in a selected position to the rear of a bow when it is turned on its pivotal connection which said carrier to the mounting member, the carrier having a groove extending through the top of the carrier at an angle to permit the passage of the vane of an arrow through the groove, and a low friction roller positioned on each side of the groove and on each side of the line of flight of an arrow, the axis of rotation of one roller being a vertical axis, the axis of rotation of the other roller being at an angle of 45 to 50 degrees from the axis of rotation of said one the roller.

4,598,689

OVEN SYSTEMS

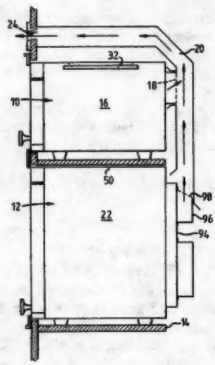
Kenneth I. Eke, Sanderstead, England, assignor to Microwave Ovens Limited, Shirley, England

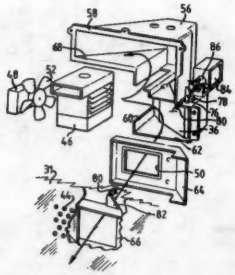
Filed Jan. 28, 1985, Ser. No. 695,531

Claims priority, application United Kingdom, Feb. 2, 1984, 8402757

Int. Cl.[4] A21B 1/00

U.S. Cl. 126—21 A **6 Claims**





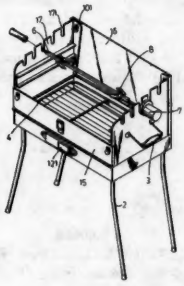
1. An oven system comprising a microwave oven unit having a first cavity, a microwave generator for supplying microwave power to said first cavity and thermal heating means for supplying thermal power to said first cavity, and a grill unit having a second cavity and a grill element for supplying thermal power to said second cavity, said microwave oven unit having a blower or fan capable of venting the first cavity, and duct means leading from said microwave oven unit, communicating with said second cavity and exiting to the surroundings, whereby said blower or fan causes air to flow from said microwave oven unit and along said duct means so as to entrain air from said second cavity and thereby vent the latter, means for activating the oven system which activates said blower or fan to generate a flow of air through said duct means, said first cavity being provided with a movable shutter which is movable between an open position in which the air from said blower or fan is blown into said first cavity and thence through a vent in a rear wall of said first cavity into said duct means, and a closed position in which air from said blower or fan is prevented from reaching said first cavity, said shutter being in the open position whenever the oven system is activated except when the thermal heating means are energized when said shutter is in its closed position.

4,598,690

COLLAPSIBLE CAMP STOVE

Wen Y. Hsu, No. 6, Lane 129, Fu-Kang Street, Shin Lin District, Taipei, Taiwan

Continuation-in-part of Ser. No. 628,493, Jul. 6, 1984, Pat. No. 4,548,192. This application Apr. 9, 1985, Ser. No. 721,459
Int. Cl.[4] F24B 3/00
U.S. Cl. 126—25 R 1 Claim



1. A collapsible camp stove that folds into a self-contained substantially rectangular package comprising:

a folding casing, composed of a rectangular receptacle, a front panel formed at each vertical side with a hole in which is slidably mounted a fastener, a rear panel formed at vertical side with two holes in each of which is slidably mounted a fastener, and two side panels each formed at the top with notches and at the vertical side with a flange having a locking hole which is positioned such that said side panels are connected when put together respectively with said front panel and said rear panel and said fasteners slidably mounted in the holes of said front panel and said rear panel are moved downwards, such that said side panels disconnect from said front panel and said rear panel when said fasteners slidably mounted in the holes of said front panel and said rear panel are moved upwards allowing said folding casing to be folded into a compact case, each said side panel being provided at the inner surface with an upper rail and a lower rail and at the top edge with a plurality of notches, said rectangular receptacle being fitted in the front with an air baffle for controlling air flow entering into said folding casing for combustion of fuel therein and further provided in the bottom with four socket members;

four leg members, each engageable with one of said four socket members of said rectangular receptacle;

two grips, each engageable with one of said two side panels;

a grate disposed in said folding casing for supporting burning fuel within and above inside bottom surface of the receptacle of said folding casing;

a roasting frame having a holding member movably mounted thereto so that said holding member can be moved out to act as a handle, said roasting frame being adapted to be supported by said upper rails or said lower rails of the side panels of the folding casing for supporting food items at a predetermined height above the burning fuel;

two laterally spaced pairs of cooperating fastening devices secured to outer surface of said front panel and outer surface of said rear panel, respectively, to permit a securement of said side panels, said front panel and said rear panel in closed position over open top of said receptacle; and

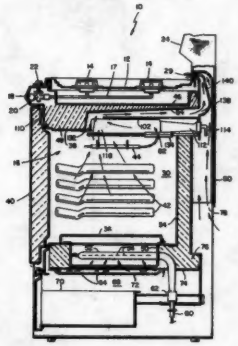
a plurality of roasting rods adapted to be supported by the notches of the side panels of said folding casing, said roasting rods being engageable with a motor at one end so that said roasting rods will be rotated when said motor is turned on.

4,598,691

GAS OVEN WITH RECESSED BROIL BURNER

Edward J. Herrelko, Bethlehem; James E. Hurley, and William J. Day, both of Allentown, all of Pa., assignors to Raytheon Company, Lexington, Mass.

Filed Apr. 1, 1985, Ser. No. 718,623
Int. Cl.[4] F24C 3/04
U.S. Cl. 126—41 R 11 Claims



1. A gas oven comprising:

an oven cavity having side walls, a back ball, a floor, a ceiling with an aperture, and a front door;

a chamber disposed above said ceiling and communicating with said cavity through said aperture;

a partition dividing a rear portion of said chamber into upper and lower compartments, said upper and lower compartments communicating with each other solely at the front of said chamber;

a radiant gas burner substantially recessed up into said lower compartment of said chamber; and

an exhaust flue communicating with the back of said upper compartment wherein products of combustion from said burner flow forwardly in said lower compartment, upwardly into said upper compartment while mixing with vapors from said cavity, and then rearwardly in said upper compartment for exhaust through said exhaust flue.

2. A gas oven comprising:

an oven cavity comprising side walls, a back wall, a floor, a ceiling having a recess, and a front door;

a radiant gas burner substantially positioned in said recess;

an exhaust flue communicating with the back of said recess;

means for providing gaseous fuel to said burner, said fuel burning upon issuing from said burner for broiling food in said cavity; and

means for directing substantially all products of combustion from said burning forwardly, upwardly, and then backwardly within said recess above said burner to said exhaust flue.

4,598,692

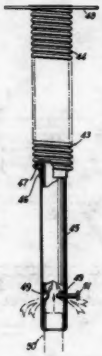
UNIVERSAL GAS BURNER AND DUAL ADJUSTABLE FLEXIBLE VENTURI TUBE ARRANGEMENT FOR GAS BARBEQUE GRILLS

Robert J. Hitch, Columbus, Ga., assignor to W. C. Bradley Company, Columbus, Ga.

Filed Nov. 19, 1984, Ser. No. 672,470
Int. Cl.[4] F24C 3/04
U.S. Cl. 126—41 R 10 Claims

1. A universal burner system for diverse forms of gas fired

barbecue grills comprising a universal burner element having a diverse arrangement of gas/air inlet openings in its bottom wall, at lease one longitudinally extensible and retractable and flexible gas/air feeder venturi tube assembly, said tube assembly including a flexible conduit section and a substantially straight and rigid venturi tube section having air inlet means telescopically engaged adjustably within the flexible conduit section for changing the effective length and curvature of said tube assembly, said flexible conduit section having a reduced diameter cylindrical sleeve extension on one end thereof tele-



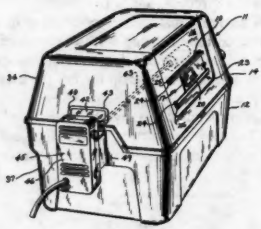
scopically and slidably receiving said venturi tube section therein, and a flange on one end of the venturi tube section of somewhat larger diameter than the diameter of said sleeve extension but smaller than the internal diameter of said flexible conduit section, means to couple one end of said tube assembly in communication with one of said gas/air inlet openings, means to cover the other gas/air inlet openings in said bottom wall, and means to couple the other end of said tube assembly in communication with a gas supply and gas flow control means of a gas fired barbecue grill on which the universal burner system is installed.

4,598,693

MOVABLE SIGHT PANEL FOR COOKING APPARATUS

Walter Koziol, Antioch, Ill., assignor to Modern Home Products Corp., Antioch, Ill.

Filed Jul. 30, 1984, Ser. No. 635,559
Int. Cl.[4] A47J 37/00; F24C 3/12
U.S. Cl. 126—41 R **5 Claims**



1. An illuminated and internally visible barbecue grill unit comprising:

a grill housing unit including a base member and a cover member having an opening therein said cover member adapted to be positioned on the base member and opened therefrom;

a slidable panel member having at least two spaced apart panel sections each of which is of a dimension to cover said opening when in different positions, one of said panel sections being composed of a transparent material;

guide track means constructed and arranged in conjunction with said cover opening to slidably position said transparent panel section over said opening in one stage and to position said other panel section over said opening in another stage, said guide track means having a length greater than the length of said panel member; and

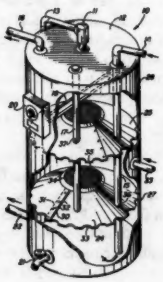
illumination means defined by a light source externally mounted on said grill housing unit and including a window member in said grill housing unit to allow light to pass from said light source into said grill unit.

4,598,694

WATER HEATER PARTITION AND METHOD

Charles J. Cromer, 460 Indian Creek Dr., Cocoa Beach, Fla. 32931

Filed Jan. 8, 1985, Ser. No. 689,727
Int. Cl.[4] F24H 9/14
U.S. Cl. 126—361 **8 Claims**



1. A water heater partition member comprising:

a generally circular flat partition member having a peripheral edge and a central opening therethrough, with a generally wedge shaped gap therein between the outer periphery and the central opening in said flat partition member; said partition member having at least one aperture therein, and said flat partition member being bent to form a generally truncated cone shape having the edge portions along the wedge shaped gap attached together and having a screen member thereto covering said flat partition member central opening.

7. A method of making a water heater have a partitioned water tank comprising the following steps:

making a partition for a water tank having a circumference larger than the walls of said water tank, with a central opening and a wedge shaped gap formed therein;

bending said partition member to form a generally truncated cone shape;

inserting said truncated cone shaped partition member in a water heater tank below a heating element in said water tank so that at least a portion of said heating element lies directly above said central opening,

attaching the edge portions of said partition along the wedge shape gap together to form a generally truncated cone shape; and

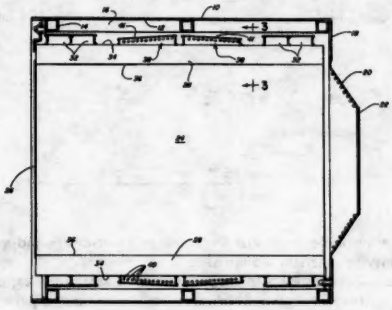
press fitting the truncated cone shaped partition member into said water heater.

4,598,695

SOLAR BOILER OR ENERGY STORAGE APPARATUS

Richard E. Niggemann, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed May 30, 1985, Ser. No. 739,566
Int. Cl.[4] F24J 2/32
U.S. Cl. 126—433 7 Claims



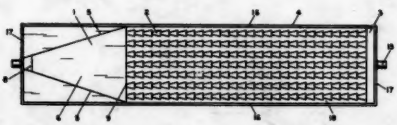
1. A solar boiler or energy storage device comprising:
a housing having a generally cylindrical interior wall and including heat receiving means;
a plurality of elongated axially extending individual first heat pipes in proximity to said interior wall and disposed about the periphery thereof;
a plurality of circumferentially extending individual second heat pipes in proximity to said wall over a predetermined axial portion thereof and in heat transfer relation with said first heat pipes on the radially outer sides thereof; and
at least one circumferentially extending heat exchanger in heat transfer relation with said first heat pipes at a location axially spaced from said second heat pipes.

4,598,696

BLACK-WATER SOLAR PANEL

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Apr. 24, 1985, Ser. No. 726,579
Int. Cl.[4] F24J 2/10
U.S. Cl. 126—448 1 Claim



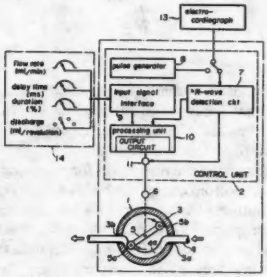
1. A back-water solar panel comprising a spreading chamber (1), a series of seven parallel flow tubes (2) and an outlet chamber (3) mounted inside an elongate rectangular panel (4):
a. said elongate rectangular panel (4) having two vertical parallel side walls (16), two vertical parallel end walls (17), a base (18) and a plate glass cover (19), and a longitudinal axis;
b. said spreading chamber (1), having a narrow inlet end (8) and a wide outlet end (9) and two vertical side walls (5) inclined 18° from the longitudinal axis of the panel (4), an upper wall (6), and a lower wall (7) inclined 2° from the longitudinal axis, said side walls (5), upper wall (6) and lower wall (7) being transparent glass and extending from the narrow inlet end (8), to the wide outlet end (9) of spreading chamber (1);
c. said flow tubes (2) comprising multiple frusto-conical sections (10) having a longitudinal axis, the sections having transparent glass section walls (11) inclined 15° from the longitudinal axis and having a small inlet end (12), a large outlet end (13) and an end wall (14) connecting the small inlet end (12) to the large outlet end (13) of the adjacent frusto-conical section (10); and
d. a heat absorbing liquid medium for use in the collector comprising water to which a black dye has been added to render the water opaque to the transmission of light.

4,598,697

BLOOD PUMP APPARATUS

Masaaki Numazawa, Kamakura, and Hidetaka Tashiro, Hatano, both of Japan, assignors to Senko Medical Instrument Mfg. Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1984, Ser. No. 659,095
Claims priority, application Japan, Dec. 29, 1983, 58-247623
Int. Cl.[4] A61M 1/00
U.S. Cl. 128—1 D 4 Claims



1. A blood pump apparatus for pumping blood into a body of a patient in synchronism with an output of an electrocardiograph connectable to the body of the patient comprising:
(a) a fluid pump driven by a variable rotation speed electric motor for feeding the blood;
(b) data input means for inputting data relating to operation of said pump, said data including data representative of discharge of said pump per a predetermined number of revolutions of said motor, data representative of delay time to be lapsed before an actuation of said motor, data representative of duration of the actuation of said motor, and data representative of amount of the blood to be fed per a unit period of time;
(c) R-wave detection means for detecting R waves from the output of the electrocardiograph to output a signal indicative of timing of said R waves and data representative of interval between two adjacent ones of said R waves;
(d) means for calculating, in accordance with the data representative of said discharge of the pump, said duration of the actuation of said motor, said amount of blood to be fed and said interval between the two adjacent R waves, a rotation speed of said motor required to feed said amount of blood per said unit period of time, said calculation means outputting a signal representative of said calculated rotation speed and said duration of the actuation of said motor; and
(e) motor drive means responsive to said signal indicative of said timing of the R waves and said signal representative of said calculated rotation speed and duration of the actuation of said motor for driving said motor so that said

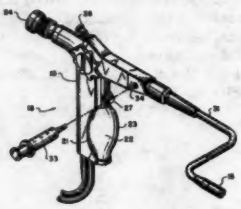
motor begins to rotate at said calculated rotation speed when said delay time has lapsed from each of the detections of said R waves and stops when said duration has lapsed.

4,598,698

DIAGNOSTIC DEVICE

Walter P. Siegmund, Woodstock, Conn., assignor to Warner-Lambert Technologies, Inc., Morris Plains, N.J.

Continuation of Ser. No. 459,568, Jan. 20, 1983, abandoned. This application Jan. 17, 1985, Ser. No. 692,434
Int. Cl.[4] A61B *1/00*
U.S. Cl. 128—4 3 Claims



1. In an endoscope useful for examinations and retrievals in remote internal locations in medical or veterinary situations where the scope includes a pistol grip and a flexible pneumatic bulb, the improvement comprising:

a cavity formed in the pistol grip for receiving and enclosing a top and bottom end of the bulb while leaving the middle of the bulb exposed, said cavity having a top portion and a bottom portion, said bulb top end defining a discharge end and said bottom defining an inlet end, the ends of said bulb being secured to complementary top and bottom portions of said cavity whereby the middle of the bulb is operable by the digits of a pistol-gripping hand.

4,598,699

ENDOSCOPIC INSTRUMENT FOR REMOVING STOMACH INSERT

Lloyd R. Garren, and Mary L. Garren, both of P.O. Box 3738, Wilmington, Del. 19807

Filed Jun. 10, 1985, Ser. No. 743,000
Int. Cl.[4] A61B *1/00*
U.S. Cl. 128—4 4 Claims

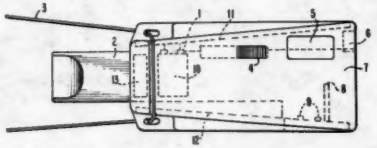
1. An endoscopic instrument for removing an inflated insert from a stomach cavity comprising an elongated flexible tube having passageway means therein, holding means at one end of the flexible tube constructed and arranged to grasp an inflated stomach insert, first operator means connected to manipulate the holding means extending through the passageway means to the opposite end of the flexible tube, deflating means at the same end of the tube as the holding means constructed and arranged to penetrate an inflated stomach insert to thereby cause deflation thereof, and second operator means connected to manipulate the deflating means extending through the passageway means to the opposite end of the flexible tube.

4,598,700

APPARATUS FOR MEASURING PULSE RATE AND PULMONARY VOLUME

Ulf S. Tamm, 122 Ch. de la Montagne, 1224 Chene Bougeries, Switzerland

Continuation of Ser. No. 475,217, Mar. 14, 1983, abandoned. This application Feb. 8, 1985, Ser. No. 699,232
Int. Cl.[4] A61B *5/08*
U.S. Cl. 128—671 15 Claims



1. A portable apparatus for measuring pulse rate and vital capacity of a person, comprising:

a case having means formed therein for transmitting expired air therethrough and for receiving a portion of a person's body to measure pulse rate;

means for measuring vital capacity disposed within said means for transmitting expired air and for receiving a portion of a person's body;

means for measuring pulse rate disposed within said means for transmitting expired air and for receiving a portion of a person's body; and

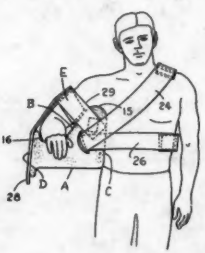
a source of electrical power disposed within said case for operating said means for measuring vital capacity and for operating said means for measuring pulse rate.

4,598,701

SHOULDER ABDUCTION SPLINT

Daniel J. Schaefer, Greenville, S.C., assignor to Span-America Medical Systems, Inc., Greenville, S.C.

Filed May 11, 1984, Ser. No. 609,457
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—87 C 6 Claims



1. A shoulder abduction splint for selectively supporting in one of at least two different orientations the arm of a user, comprising:

an integral block of resilient material, having

an upright support surface having two edge portions and adapted to be carried against the body of a user,

a first surface extending generally perpendicularly from one edge portion of said upright support surface, and adapted for selectively supporting an arm of a user,

a second surface extending at an angle from another edge portion of said upright support surface towards said first surface, and adapted for selectively supporting an arm of a user,

a free upright surface, opposite to and parallel with said

upright support surface, and having two flange edges, and

a forearm and hand support surface, opposite to and generally parallel with said first surface, for supporting the forearm and hand of a user whenever said splint is turned such that said second surface is supporting an arm of a user, wherein

whenever said splint is turned such that either of said first and second surfaces supports an arm of a user, one of said flanges of said free upright surface applies inward pressure along the length of the upper arm of said user's arm so as to thereby reduce tension on the user's shoulder joint.

4,598,702

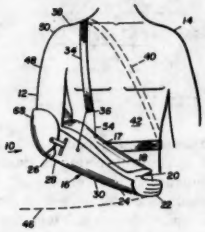
CANTILEVERED SUSPENSION SLING

James A. Lilla, 4431 Ashton Dr., Scaramento, Calif. 95825

Continuation of Ser. No. 354,445, Jul. 1, 1982, Pat. No. 4,497,316. This application Jul. 30, 1984, Ser. No. 635,577

Int. Cl.[4] A61F *5/10*

U.S. Cl. 128—94 **6 Claims**



1. A sling for supporting an arm of a patient, comprising:

an arm support member of a semi-rigid or rigid material providing a trough for supporting the distal end of a patient's forearm at the distal end of the trough and the patient's elbow at the proximate end of the trough with the middle portion of the trough partially encircling and supporting the patient's forearm; and

a strap coupled at one end to the middle portion of the arm support member away from the distal end of the arm support member, and adapted to extend therefrom over the ipsilateral shoulder of a patient diagonally downward across the patient's back and across the front of the patient's upper body to be coupled at the other end thereof to the arm support member near the patient's elbow, whereby said strap supports the arm support member in a cantilevered fashion from the patient's ipsilateral shoulder;

said sling further comprising an elbow piece coupled to the arm support member and including means for adjustably fixing the elbow piece at various angles with respect to said trough formed by the arm support member to accommodate various angles of elevation of the distal end of the patient's forearm relative to the patient's elbow.

4,598,703

HEMI-ARM SLING

Peer Lindemann, West Bend, Wis., assignor to Rolyan Manufacturing Co. Inc., Menomonee Falls, Wis.

Filed Oct. 2, 1985, Ser. No. 783,164

Int. Cl.[4] A61F *5/00*

U.S. Cl. 128—94 **20 Claims**

1. A hemi-arm sling comprising:

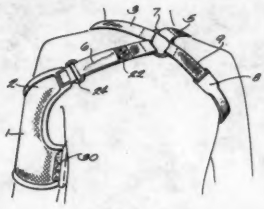
an adjustable humeral cuff for embracing an arm;

a posterior tension distribution ring for distributing tension;

a posterior strap connected between said cuff and said ring to regulate the degree of external rotation of the humeral cuff;

a clavical strap connected between said cuff and said ring extending over an affected shoulder for vertically positioning the humeral cuff;

a shoulder loop connected to said ring and embracing the unaffected shoulder;



an anterior strap connected between said shoulder loop and said cuff for adjusting the degree of internal rotation of said cuff to thereby provide an adjustable shoulder support.

4,598,704

AEROSOL INHALATION DEVICE

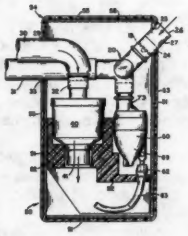
Maurice E. Bordoni, Westtown, and Ephraim Lieberman, Suffern, both of N.Y., assignors to Cadema Medical Products, Inc., Middletown, N.Y.

Division of Ser. No. 642,718, Aug. 22, 1984, Pat. No. 4,510,929, which is a continuation of Ser. No. 360,370, Apr. 30, 1982, abandoned. This application Mar. 1, 1985, Ser. No. 707,387

The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.

Int. Cl.[4] A61M *11/00*

U.S. Cl. 128—200.14 **18 Claims**

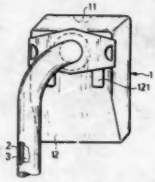


1. An aerosol inhalation device for supplying an aerosol mist to a subject, the device comprising first conduit means for providing an exclusive inhalation path and second conduit means for providing an exclusive exhalation path, mouthpiece means connected to the first and second conduit means, valve means for controlling inhalation solely via said first conduit means and exhalation solely via said second conduit means, respectively, a nebulizer coupled to said first conduit means, means in fluid communication with said nebulizer for allowing introduction of liquid into said nebulizer, means associated with said nebulizer for generating an aerosolized mist carrying airborne particles, means for introducing a mixture of air and the mist into said first conduit means, and entrapping filter means coupled to said second conduit means for removing the aerosol exhaled.

4,598,705
TRACHEA CANNULA

György Lichtenberger, Pozsonyi út 15-17. V.1., H-1137 Budapest, Hungary

PCT No. PCT/HU84/00002, § 371 Date Sep. 14, 1984, § 102(e) Date Sep. 14, 1984, PCT Pub. No. WO84/02657, PCT Pub. Date Jul. 19, 1984
PCT Filed Jan. 13, 1984, Ser. No. 662,406
Claims priority, application Hungary, Jan. 14, 1983, 124/83
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—200.26 6 Claims



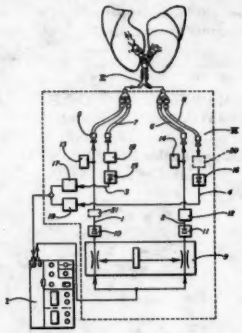
1. An improved trachea cannula comprising a curved outer tube (2) and an inner tube (3) that is slidably and removably fitted within said outer tube (2), said outer tube (2) being insertable into the trachea of a patient through a neck hole opened surgically by laryngotracheotomy, wherein said trachea cannula comprises a box-like receptacle (1) having a coupling hole (122) attached to the open outer end of said inner tube (3) in order to prevent secretion discharge into the surroundings of the patient, wherein said box-like receptacle (1) is of the disposable kind made preferably of plastic material, and having a closed front wall (11) a rear wall (12) facing the patient's chest, bottom, top and side walls, said coupling hole (122) being cut out from the rear wall (12) of said receptacle (1) so as to match both in shape and dimension at least partially the open outer end branch of said inner tube (3), comprising two breathing holes (121) in the rear wall (12) of said receptacle (1), arranged at both sides close to said coupling hole (122) for the open outer end of said inner tube (3) in a manner that said breathing holes (121) and the coupling hole (122) form a single shaped opening within said rear wall (12) of said receptacle (1).

4,598,706
APPARATUS FOR INDEPENDENT VENTILATION OF TWO LUNGS WITH SELECTIVE USE OF POSITIVE END-EXPIRATORY PRESSURES

Marek Darowski, Warsaw, Poland, and Göran Hedenstierna, Djursholm, Sweden, assignors to Polska Akademia Nauk Instytut Biocybernetyki i Inzynierii Biomedycznej, Warsaw, Poland

Filed Feb. 27, 1984, Ser. No. 584,122
Claims priority, application Poland, Mar. 4, 1983, 240878
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—205.24 2 Claims

1. An apparatus for controlling and dividing ventilation between two lungs with selective use of positive end-expiratory pressures, comprising: a single respirator, a double-lumen bronchial tube, conduit means connecting means respirator with the lungs by means of said double-lumen bronchial tube, said conduit means including two inspiratory and two expiratory branches connected in two inspiratory-expiratory pairs, each pair being terminated by a common point of the inspiratory and expiratory branches and being coupled with one of two conduits of the double-lumen bronchial tube, said double-lumen bronchial tube together with the two parallel inspiratory branches and two parallel expiratory branches including means adapted to separate gas flows between the respirator and each lung respectively, one of the said expiratory branches being provided with a positive end-expiratory pressure valve to apply this pressure selectively to one lung only, a threshold inspiratory valve to control the distribution of ventilation between the lungs and to pattern an increasing gas flow through one inspiratory branch and a decreasing inspiratory gas flow through the other inspiratory branch, said threshold inspiratory valve being placed in one inspiratory branch having a common point with the expiratory branch not provided with the positive end-expiratory pressure valve, a pneumatic unidirectional valve being placed in said one inspiratory branch, said threshold inspiratory valve being connected in series with a pneumatic unidirectional valve to prevent mixing of gases flowing through said inspiratory branches, another

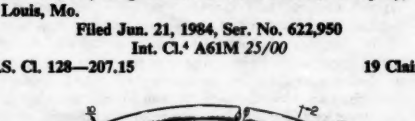


pneumatic unidirectional valve being placed in the second inspiratory branch to prevent mixing of gases flowing therethrough, one pneumatic unidirectional valve being placed in each expiratory branch to enable an independent measurement of volumes of gas expired from each lung and a total ventilation measurement by the respirator, a variable pneumatic resistor being placed in each of said inspiratory branches, and means interconnecting said resistors to inversely vary the flow through each resistor, respectively, in order to diversify to the maximum the amount of ventilation to each lung.

4,598,707
MEDICAL TUBE WITH INFLATION CUFF

Ronald T. Agdanowski, St. Peters, and James A. Geil, St. John, both of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Jun. 21, 1984, Ser. No. 622,950
Int. Cl.[4] A61M *25/00*
U.S. Cl. 128—207.15 19 Claims



1. A medical tube device comprising a tube having a portion thereof for insertion into a body cavity, an inflatable cuff connected to said tube portion, passage means connected at one end with said cuff for conveying inflating fluid to inflate said cuff when in the body cavity, a pressure indicating balloon connected at the opposite end of said passage means in fluid communication with said cuff for providing an indication of the fluid pressure condition of said cuff, hand operated fluid pressure pump means connected in fluid communication with said balloon for inflating said balloon and said cuff with fluid, and one-way valve means indicating a pair of opposed resilient valve members normally in engagement with each other to close said valve means and being connected within said balloon to allow fluid to flow in a direction therethrough from said pump means to said balloon in response to the pressurization of fluid in said pump means for inflating said cuff and normally

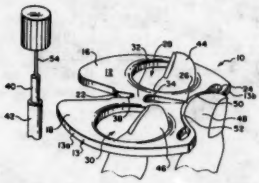
preventing fluid flow therethrough in the opposite direction, said valve members and a portion of said balloon being manually simultaneously squeezable to open said valves means and allow fluid flow through said valve means in the opposite direction for reducing fluid pressure in said cuff.

4,598,708

TORQUE CLAMP FOR USE WITH PERVENOUS LEAD HAVING FIXATION DEVICE

William J. Beranek, Cooper City, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Sep. 17, 1984, Ser. No. 651,428
Int. Cl.[4] A61B *19/00*
U.S. Cl. 128—303 R 18 Claims



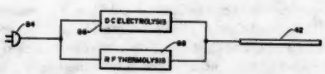
1. A torque clamp utilized for actuating a fixation device at the distal end of a pervenous lead to anchor the fixation device in the myocardum of a heart by rotation of a terminal pin of the pervenous lead comprising: a body, said body including opposed jaw portions, a jaw being defined between said jaw portions and jaw actuating means comprising a flexible bridge portion formed in said body opposite said jaw portions, said body having a cutaway spaced between an inner side of said bridge portion and said jaw portions, having a hinge portion between said jaw and said cutaway space, and having body portions on either side of said cutaway space, said bridge portion being deflectable into said cutaway space to cause deflection of said jaw portion away from each other about said hinge portion and concurrent deflection of said body portions toward each other.

4,598,709

ELECTROLYSIS MACHINE

Margaret M. Smith, Sylmar, and David C. Smith, Van Nuys, both of Calif., assignors to Clare, Inc., Sylmar, Calif.

Filed Jul. 25, 1983, Ser. No. 516,988
Int. Cl.[4] A61B *17/41*
U.S. Cl. 128—303.18 2 Claims



1. An electrolysis machine comprising:

a probe adapted to be located directly adjacent the hair follicle; and

electrical circuitry electrically connected to said probe, said electrical circuitry comprising a first circuit and a second circuit, said first circuit producing a direct current output, said second circuit producing a radio frequency output, said second circuit being completely independent of said first circuit, said first circuit including first circuit means for slowing the rise of direct current to the patient upon initial establishment of a direct current circuit with the patient, said second circuit including second circuit means for slowing the rise of radio frequency to the patient upon initial establishment of a radio frequency circuit with the patient; and

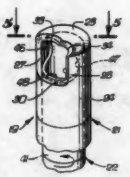
current control means included within said first circuit for controlling the current of said direct current output, said current control means including a by-pass electrical circuit path, said by-pass electrical circuit path including means for preventing current build-up within said first circuit which occurs upon loss of the electrical ground of said probe, said by-pass electrical circuit path also including means for activating said means for preventing upon sensing of a substantially increased electrical resistance of the patient, upon reconnection with the electrical ground by the patient the patient is not electrically shocked.

4,598,710

SURGICAL INSTRUMENT AND METHOD OF MAKING SAME

Larry K. Kleinberg, Burbank, and Donald S. Evans, Pasadena, both of Calif., assignors to Urban Engineering Company, Inc., Burbank, Calif.

Filed Jan. 20, 1984, Ser. No. 572,236
Int. Cl.[4] A61B *17/32*
U.S. Cl. 128—318 6 Claims



1. A surgical instrument cutting tube comprising

a body formation forming an opening extending into a distal end wall having an interior surface and into an annular wall forming said tube,

a bearing surface included in the interior surface of said distal end wall and about the axis of said tube,

the body formation for the opening in said distal end wall comprising a pair of circularly-formed radiused-cut cutting edges having contiguous extemities joined together at a protrusion of said bearing surface between the tube's axis and the opening in said annular wall,

the body formation for the opening in said annular wall comprising a pair of spaced parallel radiused-cut cutting edges longitudinally disposed in said annular wall,

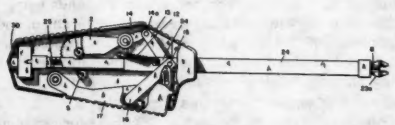
said circularly-formed radiused-cut cutting edges having opposing extremities correspondingly joining said spaced parallel radiused-cut cutting edges at corresponding non-sharp junctures of said distal end and annular walls.

4,598,711

SURGICAL INSTRUMENT

Jose C. Deniega, Brookfield, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 9, 1984, Ser. No. 639,272
Int. Cl.[4] A61B *17/12*
U.S. Cl. 128—326 6 Claims



1. A surgical instrument comprising

A. a housing having

I. a sole means for activating a force, and

II. a link for translating said force; and

B. a probe having

I. means for holding a single wound closure element,

II. a movable crimp bar for crimping said single closure element in said holding means, the proximal end of said crimp bar connected to the distal end of said link,

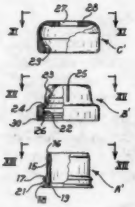
III. means for advancing a plurality of wound closure elements, and

IV. means for loading a single wound closure element, from said plurality, into said holding means, the improvement comprising said link indirectly connected to said advancing and loading means to integrally effect said crimp bar and said advancing and loading means.

4,598,712
CIRCULAR ANASTOMOSIS

Carlo Rebuffat, Via Galilei, 17, Trento, and Riccardo Rosati, Via Livorno, 4, Milano, both of Italy

Filed Feb. 13, 1985, Ser. No. 701,207
Claims priority, application Italy, Feb. 16, 1984, 19652 A/84
Int. Cl.[4] A61B *17/04*
U.S. Cl. 128—334 C **5 Claims**

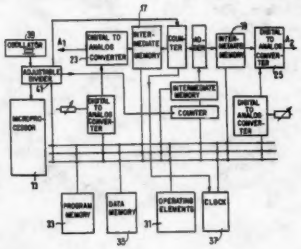


1. Device for circular anastomosis of hollow organs, which comprises three coupling elements capable of being engaged one inside the other, the first element being placed in a first hollow organ and constituting an outer element of hollow cylindrical shape and having an upper face through which is formed an axial port, said face being provided with an annular grave spaced from said axial port, the inside surface of said first element being provided with an inwardly directed mating surface close to its lower end; the second element being placed in a second hollow organ and constituting an intermediate element of hollow cylindrical shape and provided with multiple, longitudinal slots extending through upper walls thereof and therebelow with a rim forming an abutment, the inside of said second element being provided near the lower end thereof with an annular slot and the wall thickness thereof being reduced in a region above said abutment said first and second hollow organs having their respective free ends being positioned between said inside surface of said first element and said upper walls of said second element when said second member is engaged inside of said first element; the third element also being placed in said second hollow organ and constituting a hollow inner element having a cylindrical portion and a conical portion therebelow forming an abutment for engaging the inside of said intermediate element, thereby expanding said upper walls of said second element towards said inside surface of said first element in order to compress said free ends of said first and second hollow organs together.

4,598,713
ELECTROSTIMULATION THERAPY DEVICE AND METHOD

Achim Hansjürgens, and Gerhard Mionskowski, both of Karlsruhe, Fed. Rep. of Germany, assignors to Deutsche Nemectron GmbH, Karlsruhe, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 393,337, Jun. 29, 1982, abandoned. This application Mar. 5, 1985, Ser. No. 708,503
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—421 **26 Claims**



1. A device for electrostimulation therapy for producing an output signal having a desired sequence of instantaneous value changes and a desired waveshape and frequency to stimulate a portion of the human body, wherein said device comprises:

(a) a program memory for storing data comprising a plurality of discrete different values representative of signals having predetermined instantaneous value variations with time, wherein each discrete value comprises a particular instantaneous value of said signal at particular time;

(b) an adjustable control unit for selecting a desired sequence of instantaneous value changes and a desired waveshape and a desired frequency of said output signal;

(c) an intermediate memory for receiving and storing data from said program memory;

(d) a microprocessor responsive to said control unit for selecting said data in a predetermined sequence from said program memory so as to produce a plurality of discrete values in a predetermined sequence corresponding to said desired sequence of instantaneous value changes and for transferring said discrete values to said intermediate memory in said predetermined sequence;

(e) a digital to analog converter;

(f) at least one electrode connected to the output of said converter for engaging the exterior of said body and through which said output signal is transferred to said body; and

(g) address means responsive to said microprocessor for transferring said discrete values stored in said intermediate memory to said digital to analog converter in said predetermined sequence and at a predetermined speed so as to produce said output signal having the desired sequence of instantaneous value changes and the desired waveshape and frequency selected by said adjustable control unit.

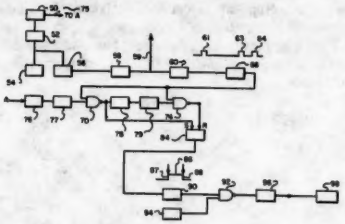
4,598,714
APPARATUS FOR MEASURING THE THICKNESS OF CORNEAS

Frederic B. Kremer, Bala Cynwyd, and Edward R. O'Brien, Wayne, both of Pa., assignors to Accutome, Inc., Frazer, Pa.

Filed Feb. 22, 1983, Ser. No. 468,289
The portion of the term of this patent subsequent to Oct. 15, 2002, has been disclaimed.
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660 **6 Claims**

1. In an apparatus for performing corneal surgery by measuring local cornea thickness by employing a hand-held probe, the measurement of thickness being made by positioning the

probe normal to surface of the cornea to produce first and second reflected ultrasonic pulses respectively from the anterior surface and the posterior surface of the cornea, and then measuring the time interval between the first and second pulses, the improvement which comprises



means for generating a gate pulse having a duration substantially equal to the time interval between said reflected first and second pulses;

means for stretching said gate pulse by a predetermined factor, said factor being at least about ten; and

means for measuring the duration of the gate pulse and for converting said measurement into an electronic signal.

4,598,715

INSTRUMENT FOR SPECTRAL MEASUREMENT IN THE BLOODSTREAM

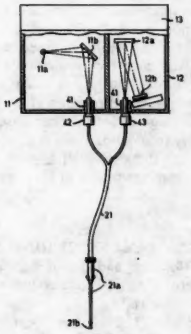
Meinrad Mächler; Sibylle Mächler, both of Ellwangen, and Richard Sachse, Königsbronn, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim on the Brenz, Fed. Rep. of Germany

Continuation of Ser. No. 488,189, Apr. 25, 1983, abandoned. This application May 14, 1985, Ser. No. 733,942

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1982, 3215879

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—634 **3 Claims**



1. Apparatus for spectral measurement in the bloodstream, said apparatus comprising:

(a) an illuminating section including a first plug socket and illuminating means for directing light to said first plug socket;

(b) a spectrometer section including a second plug socket and spectrometer means responsive to light coming from said second plug socket; and

(c) a light guide probe assembly including a probe having a measurement head, a first plug detachably inserted in said first plug socket, a second plug detachably inserted in said second plug socket, and light transmitting fibers operatively connecting said first plug and second plug to said probe;

(d) said light transmitting fibers including a first set of light guide fibers extending from said first plug through said light guide probe to said measurement head, said first set of fibers having exposed ends in fixed position in said first socket, positioned to receive light from said illuminating means and constituting means for transmitting such light along said fibers to said measurement head;

(e) said light transmitting fibers also including a second set of light guide fibers extending from said measurement head through said light guide probe to said second plug, said second set of fibers constituting light guide means for transmitting light from said measurement head to said second plug;

(f) said second set of light guide fibers at said second plug having exposed exit end surfaces arranged side by side along a thin straight line and positioned to constitute means forming by themselves an entrance slit for said spectrometer means without the need for a conventional slit;

(g) each of said plug sockets and its associated plug being so shaped relative to each other that each plug may be inserted in its socket by a straight longitudinal motion in only a single position of orientation;

(h) a spring-pressed pivoted latch associated with said first plug socket, said latch being displaced by insertion of said first plug into said first socket to a position in which said latch presses said first plug against one side of said first socket to hold it in definite predetermined position in said first socket, to insure that said exposed ends of said first set of fibers are in definite predetermined position relative to said illuminating means, said latch swinging to a position closing said first plug socket when said first plug is withdrawn from said first plug socket, to prevent passage of light from said illuminating means out through said first plug socket;

(i) said spectrometer means being a diode line spectrometer having an aperture ratio sufficient to receive the aperture of said exit end surfaces of said second set of light guide fibers without trimming; and

(j) said measurement head of said light guide probe having a diameter of not more than 0.5 mm.

4,598,716

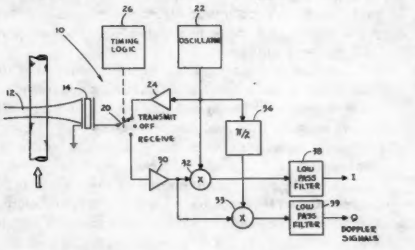
DOPPLER METHOD AND APPARATUS FOR MEASURING FLUID MOTION

Ronald E. Hileman, P.O. Box 307, King, N.C. 27021

Filed Dec. 3, 1984, Ser. No. 677,269

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—663 **23 Claims**



1. A method for determining fluid motion within a conduit by use of ultrasonic transmitting and receiving means comprising the steps of: producing and transmitting ultrasonic pulsed signals so that the pulse duration time for each signal is substantially less than the duration time between pulses and a plurality

of signals are simultaneously in transit in the range of interest; selectively activating the receiving means so that the receiving means is deactivated during the time pulsed signals are transmitted and is activated during substantially all of the time between pulses when the transmitter means is inactive; receiving with the receiving means reflected ultrasonic pulsed signals resulting from the transmitted ultrasonic signals produced during the time the receiver means is activated; obtaining Doppler signals from the reflected and received signals; and generating a fluid motion indication as a function of the Doppler signals whereby the receiving means is responsive to fluid motion at substantially all ranges and aliasing is avoided.

4,598,717

APPARATUS FOR CLINICALLY DOCUMENTING POSTURAL VICES AND QUANTIFYING LOADS ON BODY SEGMENTS IN STATIC AND DYNAMIC CONDITIONS

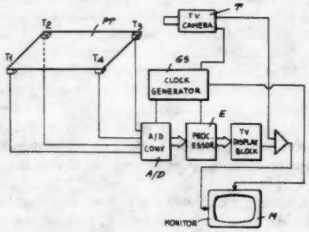
Antonio Pedotti, Brenta, Italy, assignor to Fondazione Pro Juventute Don Carlo Gnocchi, Milan, Italy

Filed Jun. 4, 1984, Ser. No. 616,876

Claims priority, application Italy, Jun. 10, 1983, 21559 A/83

Int. Cl.[4] A61B *5/10*

U.S. Cl. 128—779 **6 Claims**



1. An apparatus for clinically documenting postural vices, comprising in combination:

a platform;

a plurality of transducers arranged in proximity of said platform and measuring three mutually perpendicular components of the force exerted thereon by a subject to be examined carried on said platform, said transducers generating each an electric signal proportional to the vertical component of said force and two electric signals proportional to the resultants of the horizontal and vertical components, respectively, of said force;

clock generator means;

analog-to-digital converter means circuit-wise connected to said transducers and to said clock generator means so as to receive from said transducers said electric signals periodically at sampling times;

TV camera means arranged in proximity to said platform and circuit-wise connected to said clock generator means so as to pick up the image of said subject on said platform synchronously with said electric signals;

a processor unit circuit-wise connected to the output of said analog-to-digital converter means, said processor unit generating vectors representative of the resultants of the forces exerted by the subject on said platform calculating the application points of said vectors and driving analog and digital circuitry for directly representing said vectors;

adder means circuit-wise connected to said TV camera means and said analog and digital circuitry for adding together said vectors and said picked up image; and

monitor means circuit-wise connected to said adder means and said clock generator means for selectively displaying said vectors as overlapping the picked up image and said application points.

4,598,718

ARRANGEMENT FOR UNIFORM DISTRIBUTION OF AGRICULTURAL PRODUCTS IN SELF-PROPELLED HARVESTER THRESHERS AND HARVESTER THRESHER PROVIDED THEREWITH

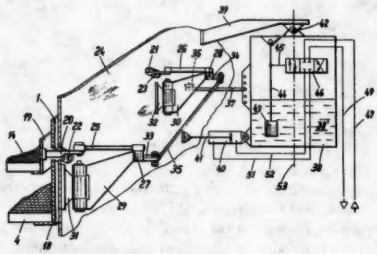
Franz Glaubitz; Günter Eis, and Werner Fromme, all of Harsewinkel, Fed. Rep. of Germany, assignors to Claas OHG, Harsewinkel, Fed. Rep. of Germany

Filed Aug. 29, 1984, Ser. No. 645,843

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1983, 3332763

Int. Cl.[4] A01F *12/32*

U.S. Cl. 130—27 AE **12 Claims**



1. An arrangement of a harvester thresher, comprising an arrangement for uniform distribution of an agricultural product on reciprocating transporting and cleaning organs of a sieve conveyor in inclined position, particularly for the uniform distribution of an agricultural product in a sieve box of a self-propelled harvester thresher on an inclined surface, wherein swinging direction and thereby transporting direction of a transported product is changeable depending on a lateral inclination of the transporting and cleaning organs, said arrangement including an upper sieve which is swingably supported in said sieve box so as to impart a movement in transporting direction to said product, and means linked to said upper sieve for changing the direction of movement of the transported product relative to a lateral side of said sieve box in dependence upon an inclined position of the harvester thresher during threshing on an inclined surface, and further comprising an elastic member by which said upper sieve is suspended on a machine housing, links engaging laterally said upper sieve and extending through a slot both in a sieve box lateral wall and through a slot in a harvester lateral wall, and position-changeable supporting pieces connected with an outer side of the harvester thresher wall and arranged so that said links are rotatably mounted on said supporting pieces.

4,598,719

CIGARETTE MANUFACTURING MACHINE

Riccardo Mattei, Bologna, and Bruno Belvederi, S. Martino di Monte San Pietro, both of Italy, assignors to G. D Societa' Per Azioni, Bologna, Italy

Filed May 7, 1984, Ser. No. 608,025

Claims priority, application Italy, May 27, 1983, 3439 A/83

Int. Cl.[4] A24C *5/18, 5/28, 5/34*

U.S. Cl. 131—84.1 **4 Claims**

1. A cigarette manufacturing machine comprising a top; first and second motors;

a plurality of rollers one of which is driven by said first motor;

a conveyor belt extending along at least part of said top and wound around said rollers, said driven roller being a driving roller for said conveyor belt;

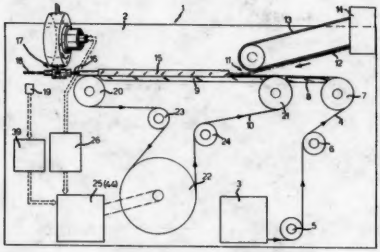
a tobacco loading station through which said conveyor belt extends, shredded tobacco being loaded at said station on to a continuous strip of paper resting on said conveyor belt;

guide means arranged downstream from said loading station and through which said conveyor belt extends, said guide means engaging said conveyor belt to wrap said strip of paper resting thereon about said tobacco to form a continuous cigarette rod;

a cutting device driven by said first motor to cut said continuous rod crosswise into pieces;

and a differential assembly connecting said first and second motors to said driving roller, said assembly comprising:

first and second rotary input members and a rotary output member;



said rotary output member being coupled to said driving roller for rotation therewith, said first rotary input member being coupled to said first motor;

said second rotary input member being coupled to said second motor;

and measuring means to measure the advancement speed of said continuous cigarette rod and to control said second motor so as to maintain an output signal from said measuring means constantly equal to a reference signal.

4,598,720

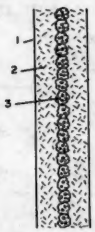
PELLETED CIGARETTE

Naeem B. Gabriel, 2 Kingsbury Sq., Apt. #19-E, Trenton, N.J. 08611

Continuation-in-part of Ser. No. 230,360, Jan. 30, 1981. This application Apr. 29, 1984, Ser. No. 605,257

Int. Cl.⁴ A24D *3/04*

U.S. Cl. 131—335 **1 Claim**



1. A cigarette comprising a paper wrapper which circumscribes a tobacco column, a plurality of pellets positioned within the tobacco column and arranged substantially linearly along the longitudinal axis of the tobacco column, said pellets comprising crushed aluminum foil so as to provide a porous structure, said pellets further comprising a medicinal substance contained in the porous structure.

4,598,721

METHOD AND APPARATUS FOR PRODUCING CRIMPED FIBRE PIECES OF RECONSTITUTED TOBACCO

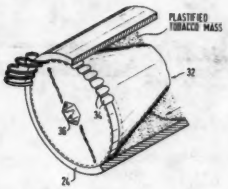
Wilfried Stiller, Holm; Jörn Ulrich, Bönningstedt, and Hartwig Sibbers, Hamburg, all of Fed. Rep. of Germany, assignors to B.A.T. Cigaretten-Fabriken GmbH, Hamburg, Fed. Rep. of Germany

Filed Oct. 29, 1984, Ser. No. 665,838

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339247

Int. Cl.⁴ A24B *3/14*

U.S. Cl. 131—375 **16 Claims**



1. In a method of making crimped fibre pieces from reprocessed tobacco,

(a) in which tobacco dust and/or tobacco waste is processed with binders and possibly additives to a plastifiable mixture,

(b) the mixture obtained is extruded to individual filiform intermediate products and

(c) the extruded filiform intermediate products are processed to crimped fibre pieces, the improvement

(d) in which in an extruder a cylindrical skein of the plastified mixture is shaped to a thin-walled hollow body of increasing internal diameter and divided into filiform crimping intermediate products, and

(e) in which the crimped filiform products are separated into individual crimped fibre pieces.

4,598,722

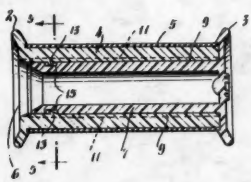
ELASTOMER HAIR ROLLER

Edward J. Doyle, Hatboro, Pa., assignor to Conair Corporation, Edison, N.J.

Filed Sep. 17, 1984, Ser. No. 651,603

Int. Cl.⁴ A45D *2/12*

U.S. Cl. 132—33 R **8 Claims**



1. A cylindrical hair roller having an elastomeric surface including

a first portion having a hollow cylindrical barrel and an integral end flange, said barrel having a uniform diameter,

an elastomeric sleeve of a length and diameter to fit about said barrel throughout its length, and positioned thereon,

a second portion having a core dimensioned for complementary fit within said hollow barrel and a flange integral therewith, and

complementary snap-fit latch means on said core and within said first portion for permanently securing together said first portion and said second portion,

whereby a hair roller is provided having a uniform barrel covered with an elastomer and flanges at the ends thereof.

4,598,723
MATERIAL APPLICATOR

Rodney D. Cole, 24 Pine Walk, Cobham, Surrey, United Kingdom

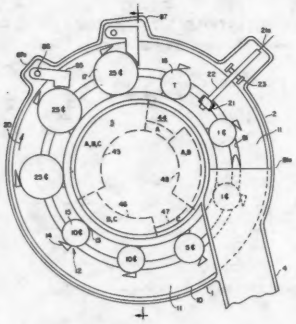
Filed Oct. 4, 1984, Ser. No. 657,767
Claims priority, application United Kingdom, May 23, 1984, 8413128; Aug. 1, 1984, 8419571
Int. Cl.[4] A45D *40/30*
U.S. Cl. 132—88.7 **20 Claims**

1. An applicator for the application of a pasty, liquid or semi liquid cosmetic product comprising:
an elongate member having a product-retaining portion comprising elements or material for retaining the cosmetic product; and
a cover member for at least partially covering said elements or material of said product-retaining portion;
said elongate member and said cover member being relatively movable to vary the covering of said elements or material of said product-retaining portion by said cover member.

4,598,724
COIN COUNTER

Adam J. Boland, Belmont, Mass., assignor to Wellman Company, Inc., Medford, Mass.

Filed Aug. 22, 1984, Ser. No. 643,171
Int. Cl.[4] G07D *9/04*
U.S. Cl. 133—8 R **27 Claims**

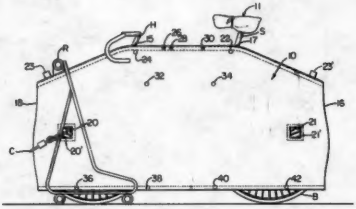


1. In coin counting apparatus wherein coins of various denominations to be counted fall upon a rotating table that is designed to catch and hold coins of different denominations at different positions on the table so that signal initiating means may detect coins so held on the table and initiate a count of the coins so held, the improvement comprising,
(a) a surface driven in rotation at an axis in synchronism with the rotation of the table,
(b) means defining arc segments on said surface that correspond to the radial positions of coins held on the table, and
(c) means for detecting coins that are caught and held on the table and producing an initiating signal when a coin so held is detected,
(d) means for sensing said arc segments and producing signals representative of the denomination of the coin held at the corresponding position on the table, and
(d) means responsive to said representative signals and said intiating signal for calculating the value of coins so detected.

4,598,725
CONVERTIBLE PONCHO

Barney J. Brewer, 0483 Four O'Clock Rd., Breckenridge, Colo. 80424

Filed Jan. 16, 1985, Ser. No. 691,859
Int. Cl.[4] E04H *15/30*; A41D *3/08*
U.S. Cl. 135—95 **17 Claims**

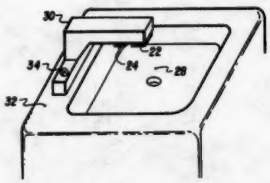


1. A convertible poncho comprising:
at least one sheet of flexible, water-resistant material defining opposite side panels including upper and lower peripheral edges, lower releasable fastening means along said lower peripheral edges and upper complementary releasable fastening members at selected locations on interior portions of said panels, a limited opening formed at an intermediate portion of said upper peripheral edge, said lower releasable fastening means on said lower peripheral edges attachable to said upper complementary releasable fastening members on said interior portions of said panels whereby to detachably secure front and rear portions of said panels in folded relation to one another in the form of a poncho, said lower releasably fastening means including a pair of spaced fasteners along said lower peripheral edge of each panel attachable together to define a sleeve.

4,598,726
ULTRASONICALLY OPERATED WATER FAUCET

Robert B. Pepper, 55-140 Calhoun St., Thermal, Calif. 92274

Continuation of Ser. No. 486,789, Apr. 20, 1983, abandoned, which is a division of Ser. No. 247,997, Mar. 26, 1981, Pat. No. 4,402,095. This application Oct. 3, 1984, Ser. No. 658,051
Int. Cl.[4] E03C *1/05*
U.S. Cl. 137—1 **14 Claims**



1. A method of controlling the flow of fluid from a faucet having fluid outlet comprising:
detecting the distance of an object from the faucet fluid outlet and whether the object is in a position where the fluid will flow onto the object from the fluid outlet;
turning on the fluid flow when the distance is equal to or less

than a predetermined limit and the object is in a position where the fluid will flow onto the object from the fluid outlet; and

turning off the fluid flow when the distance is equal to or greater than a predetermined limit or the object is not in a position where the fluid will flow onto the object from the fluid outlet.

4,598,727

METHOD OF REMOVING CHIPS FROM THE END PORTION OF AN UPWARDLY EXTENDING CONDUIT

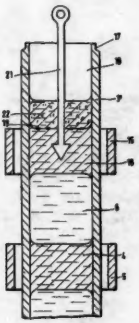
Günter Schröder, Minden-Dützen, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Sep. 4, 1984, Ser. No. 647,022

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1983, 3331492

Int. Cl.⁴ F16L *37/28*

U.S. Cl. 137—15 **3 Claims**



1. Method for performing remotely-controlled maintenance work on upwardly extending conduits conducting liquid and disposed in a radioactively-ladened cell such as a large-area cell of a nuclear facility for reprocessing irradiated nuclear fuel, the maintenance work including removal of a conduit segment, the method comprising the steps of:

forming an upper frost plug in said conduit at a position above an upper cutting location;

forming a lower frost plug in said conduit at a position beneath a lower cutting location.

forming a third frost plug above said lower frost plug so as to be spaced from said lower frost plug and be beneath said lower cutting location;

cutting said conduit at said upper and lower cutting locations and removing the conduit segment from said coduit so that whereby chips produced by the cutting step drop into the liquid in a portion of the conduit above said third frost plug and beneath said lower cutting location;

lowering holding means into an end of the conduit beneath said lower cutting location and immersing said holding means into said liquid containing said chips;

freezing said liquid containing said chips so as to cause said liquid and said third frost plug to conjointly define a common frost plug; and,

removing said common frost plug from said conduit by lifting said holding means.

4,598,728

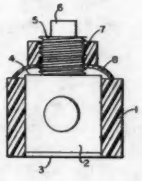
PLUGCOCKS

Daniel A. C. Ralet, 66, Boulevard Poincare, B-1070 Brussels, Belgium

Continuation-in-part of Ser. No. 553,367, Nov. 18, 1983, abandoned, which is a division of Ser. No. 277,355, Jun. 25, 1981, abandoned. This application Nov. 14, 1985, Ser. No. 798,144

Int. Cl.⁴ F16K *5/02*

U.S. Cl. 137—15 **6 Claims**



1. A process for producing a thermally undeformable plastic rotary plug-cock assembly mounted in permanent liquid food-handling installations requiring regular and repeated exposure to sterilizing temperatures, said process comprising selecting plastic materials for forming a body and a truncated cone-shaped plug member of said plug-cock assembly, which selecting step comprises choosing plastic materials that meet a predetermined high rigidity and size stability characteristic, and a high degree of free and smooth slidability of contacting parts required for said permanent liquid food-handling installations due to regular and repeated exposure of said plug-cock assembly to sterilizing temperatures therein, forming said body and said plug member from said selected plastic materials, said plug member being formed of a material different from said body material, and disposing said plug member rotatably within said body so as to produce said thermally undeformable plastic plug-cock assembly mounted in said permanent liquid food-handling installations, said selected plastic materials comprising substantially of polyvynilidene fluoride for forming said body, and of a thermoplastic material selected from the group consisting of polypropylene, polyethylene of high density, polyamide, and PTFE (polytetrafluorethylene) for forming said plug member.

4,598,729

NEGATIVE PRESSURE CONTROL VALVE

Mitikatu Naito, Nagoya; Kiyotosi Yano; Kazuo Itou, both of Kariya; Kunihiro Tsuzuki, Oobu; Masaaki Tanaka, and Michio Kawagoe, both of Susono, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Jun. 15, 1982, Ser. No. 388,659

Claims priority, application Japan, Jun. 19, 1981, 56-94609; Aug. 10, 1981, 56-118609[U]; Sep. 28, 1981, 56-143651[U]; Oct. 26, 1981, 56-159416[U]; Oct. 26, 1981, 56-159417[U]

Int. Cl.⁴ G05D *16/06*

U.S. Cl. 137—116.5 **1 Claim**

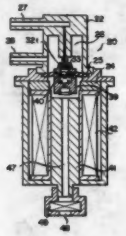
1. A negative pressure control valve for controlling a negative pressure, comprising:

a. a diaphragm chamber in which the negative pressure is set, one surface of said diaphragm chamber being defined by a diaphragm, said diaphragm chamber having an inlet port communicating with a negative pressure port and an outlet port communicating with a negative pressure load;

b. an atmospheric pressure chamber set at atmospheric pressure and disposed adjacent to said diaphragm chamber through said diaphragm;

c. a valve holding member made of a magnetic material held by said diaphragm and having a valve mechanism for

selectively communicating said diaphragm chamber with said atmospheric pressure chamber; and



d. a solenoid operated mechanism for controlling said valve holding member by attracting said magnetic material in response to an exciting current so as to counteract the negative pressure in said diaphragm chamber.

4,598,730

FLOW CONTROL VALVE

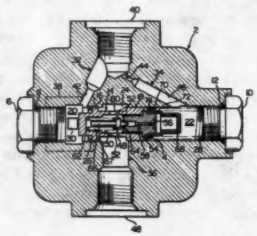
Akira Nakamura, Tokyo; Shunji Asao, and Yoshiyuki Ito, both of Sagamihara, all of Japan, assignors to Caterpillar Mitsubishi Ltd., Tokyo, Japan

Filed Aug. 24, 1984, Ser. No. 644,213

Claims priority, application Japan, Aug. 29, 1983, 58-133320[U]

Int. Cl.[4] F16K *17/22*

U.S. Cl. 137—117 17 Claims



1. A flow control valve comprising:

a valve body,

a bore formed in the valve body with at least one end being open,

plug means detachably mounted on said one end of the bore for closing said one end,

spool means slidably received in the bore, one side of the spool means within the bore defining a first oil chamber, the other side thereof within the bore defining a second oil chamber, and the intermediate surrounding part of the spool means defining a drain chamber,

limiting means for limiting the movement of the spool means toward the first oil chamber to a predetermined position,

differential pressure prescribing spring means for eleastically biasing the spool means toward the first oil chamber,

an influent passage formed in the valve body extending from an oil influent opening to the first oil chamber,

an effluent passage formed in the valve body extending from the first oil chamber toward an oil effluent opening and including a differential pressure generating orifice,

a differential pressure passage formed in the valve body extending from that part of the effluent passage which is downstream of the differential pressure generating orifice to the second oil chamber,

a drain passage formed in the valve body extending from the drain chamber to a drain opening,

a relief passage formed in the spool means for communicating the second oil chamber with the drain chamber,

overload relief valve means disposed in the relief passage,

the spool means being movable toward said one end of the bore against the elastic biasing action of the differential pressure prescribing spring means when the difference between the pressure of the oil in the first oil chamber and that of the oil in the second oil chamber exceeds a predetermined amount, whereby the first oil chamber is caused to communicate with the drain chamber,

the relief valve means being openable when the pressure of the oil in the second oil chamber exceeds a predetermined relief value, whereby the second oil chamber is caused to communicate with the drain chamber through the relief passage, and

a filter for covering the upstream end of the relief passage, the filter being disposed between the differential pressure prescribing spring means and the spool means and being maintained in a predetermined relation to the spool means by the elastic biasing action of the differential pressure prescribing means.

4,598,731

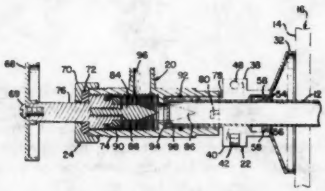
VALVE ASSEMBLY FOR PLACEMENT OVER A CAPPED, STUB-OUT WHICH IS UNDER WATER PRESSURE IN A DWELLING

Dale G. Colson, 107 Aspen La., Pacific, Wash. 98047

Filed Oct. 28, 1985, Ser. No. 792,691

Int. Cl.[4] F16K *43/00*

U.S. Cl. 137—318 14 Claims



1. A valve assembly for installation about stub-outs having sealing caps for sealing off an open end of the stub-outs extending through a wall in a dwelling for operative installation when the water system remains turned on, comprising:

(a) a subassembly of a securing means adapted for placement about at least one of the stub-outs;

(b) a subassembly of an angle stop valve adapted for positive placement, in part, over the sealing cap and over at least an upper portion of at least one of the stub-outs and to be held by the securing means, the sealing cap sealingly abuts an interior surface of said angle stop valve to prevent any leakage within said angle stop valve; and

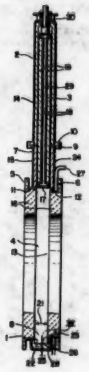
following such positive placement, the subassembly of the angle stop valve, upon actuation of said angle stop valve to a full closure position, creates an orifice in the sealing cap of said at least one of the stub-outs, and thereafter the opening and closing of the orifice during the actuation of said angle stop valve starts and stops the water flow through the valve assembly.

4,598,732

GATE VALVE HAVING INTERNAL COOLING STRUCTURE

Josef Seeger, Lindenbergakamp 8, and Wilhelm Kuckertz, Meroder Str. 14, both of 5160-Düren, Fed. Rep. of Germany

Filed Nov. 26, 1984, Ser. No. 675,065
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1983, 3343299
Int. Cl.[4] F16L 53/00
U.S. Cl. 137—334 4 Claims



1. A gate valve for use in closing and opening fluid flow through a pipeline of large diameter, particularly a pipeline having passing therethrough a high temperature fluid such as hot blast, said gate valve comprising:

a gate valve housing adapted to be installed in a pipeline, said housing having therethrough a flow passage;

a valve member mounted within said housing for movement between a first position, whereat said valve member extends across and closes said flow passage, and a second position, whereat said valve member is laterally spaced from said flow passage, thereby opening said flow passage;

said housing and said valve member having axially spaced pairs of adjacent annular surfaces cooperating to define seals when said valve member is in said first position;

said housing having therein, adjacent one said annular surface thereof defining at least one said seal, a duct, said duct extending through said housing annularly around said flow passage;

means for introducing a cooling gas into said duct;

said one annular surface of said housing having therein opening means for cooling said annular surface of said housing by directing said gas from said duct against the entire respective said annular surface of said valve member when said valve member is in said position thereof, or into said flow passage when said valve member is in said second position thereof; and

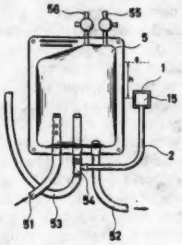
said seal formed between said annular surfaces of said housing and said valve member closing said opening means and preventing discharge therethrough of any of said gas when said valve member is in said first position thereof.

4,598,733

APPARATUS FOR DETECTING THE VOLUME OF BLOOD IN A BLOOD RESERVOIR

Michio Kanno, Saitama, and Atsuhiko Nogawa, Ninomiya, both of Japan, assignors to Terumo Corporation, Tokyo, Japan

Filed May 21, 1985, Ser. No. 736,440
Claims priority, application Japan, May 23, 1984, 59-104191
Int. Cl.[4] F16K 31/126; A61M 1/03
U.S. Cl. 137—406 12 Claims



1. An apparatus for detecting the volume of blood in a closed-type blood reservoir, comprising:

a conduct having one end in fluid communication with a lower part of said blood reservoir;

a membrane associated with the other end of the conduit, said membrane being set at a selected given height relative to said blood reservoir, and said membrane being deformable by a differential hydraulic pressure directly applied by the blood in said blood reservoir through the conduit, said differential hydraulic pressure being a function of the height of said membrane relative to said blood reservoir;

said conduit being filled with blood so that the space between said membrane and said blood reservoir is filled with blood; and

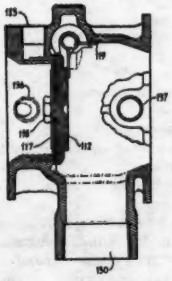
means for detecting a deformation of said membrane to thereby detect a volume of blood in said blood reservoir.

4,598,734

ALARM CHECK VALVE

Gregory R. Moyes, Auckland, New Zealand, assignor to Moygro Manufacturing Limited, Auckland, New Zealand

Continuation of Ser. No. 524,072, Aug. 17, 1983, abandoned.
This application Sep. 13, 1985, Ser. No. 775,698
Claims priority, application New Zealand, Apr. 8, 1983, 203837
Int. Cl.[4] F16K 15/03, 37/00; F16L 23/02
U.S. Cl. 137—515.7 6 Claims



1. A wafer alarm check valve, said valve including:

an annular body providing a main flow passage therthrough;

opposite ends of said body having substantially flat end faces

capable of being held between oppositely disposed flanges of a pipeline by bolts clamping said flanges towards one another with said bolts positioned about the periphery of said end faces of the valve to sandwich the valve between the flanges;

a pivotally mounted clapper within said body having a closed position capable of closing off said main flow passageway, and capable of being pivoted into an open position in which said clapper extends beyond one of said end faces of said body;

a secondary flow passageway in said body leading from a portion of said body covered by said clapper when in the closed position, and leading to an alarm outlet port for communication with an alarm directly operable by a flow of water out through said alarm outlet port when said clapper moves to the open position to open said secondary flow passageway;

a main drain port immediately downstream of said clapper, and transverse to said main flow passage;

said main drain port having a first portion extending beyond the periphery of said end faces of said body;

said first portion being of substantial rectangular cross-section and having a height extending substantially the full height of the body between said clapper and the downstream end face of the valve, said first portion having a width less than its height to avoid obstructing the positioning of the bolts extending around the periphery of the end faces;

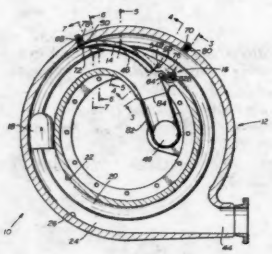
said main drain port having a second portion for a main drain connection, said second portion extending from said first portion and said second portion being of circular cross-section and having a flow area equivalent to the flow area of said first portion.

4,598,735

GUIDE VANE FOR A PRODUCT SWIVEL

Kristen I. Pedersen, Houston, Tex., assignor to Sofec, Inc., Houston, Tex.

Filed Nov. 23, 1984, Ser. No. 674,150
Int. Cl.[4] F16L *27/06*
U.S. Cl. 137—615 **10 Claims**



1. A swivel adapted for assuring the passage of a pig, comprising:

a swivel body having,

an inner ring having an outwardly facing concave inner conduit surface;

an outer ring having an inwardly facing concave inner conduit surface;

said conduit surfaces being in registration when said inner ring is assembled within said outer ring and forming a toroidally shaped conduit chamber;

means for rotatingly supporting one ring with respect to the other ring;

said swivel body having an inlet and an outlet communicating with said conduit chamber;

a guide vane retractably mounted in said inner ring, said guide vane movable relative to said swivel body between a retracted position for assembling said inner ring within said outer ring and an operating position for assuring the passage of said pig from said inlet to said outlet in said toroidally shaped conduit chamber;

means for fixedly securing said guide vane in the operating position; and

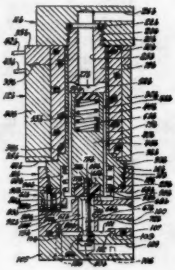
a conduit disposed in said inner ring, said guide vane positioned adjacent said conduit to provide a tangential flow path transition between said conduit chamber and said conduit when said guide vane is in the operating position.

4,598,736

SOLENOID OPERATED VALVE WITH BALANCING MEANS

William J. Chorkey, 34300 Lyncroft, Farmington, Mich. 48024

Filed Dec. 3, 1984, Ser. No. 677,214
Int. Cl.[4] F15B *13/044*
U.S. Cl. 137—625.65 **8 Claims**



1. A balanced solenoid operated valve, characterized in that it comprises:

(a) a valve body having a bore formed in one end thereof, and an axial bore having a diameter smaller than said first named bore formed in said valve body and communicating at one end with and extending axially and longitudinally inward from the first named bore;

(b) said axial bore having a poppet valve seat formed thereabout at the end thereof which communicates with said first named bore;

(c) a solenoid operatively mounted on said valve body and having a solenoid plunger provided with a first poppet valve seal axially and transversely disposed on one end thereof and a second poppet valve seal axially and transversely disposed on the other end thereof;

(d) said solenoid plunger being movable to a balanced de-energized position by a spring means and to a balanced energized position when the solenoid is energized, and when it is in the de-energized position the first poppot valve seal is seated on the poppet valve seat formed around said end of the axial bore which communicates with said first named bore;

(e) an elongated counter-balancing spool member having one end thereof attached to the end of the solenoid plunger on which the first poppet valve seal is mounted and provided on the other end thereof with a flange means carrying a seal means for sealingly engaging the axial bore;

(f) said valve being provided with cylinder port means and exhaust port means, and a pressurized fluid inlet port and passage connected to said axial bore at a position between the ends of the elongated counter-balancing spool member; and,

(g) the flow of pressurized fluid between said ports is selectively effected when the solenoid plunger is in the de-energized and energized positions.

4,598,737

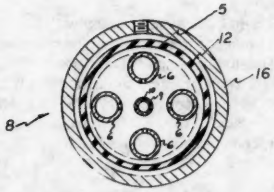
HYDRAULIC ACCUMULATOR

Ralph L. Bentley, #14 Coach Ct., St. Peters, Mo. 63376

Continuation-in-part of Ser. No. 430,821, Sep. 30, 1982, abandoned, and a continuation-in-part of Ser. No. 599,518, Apr. 12, 1984, abandoned. This application Aug. 7, 1985, Ser. No. 763,341

Int. Cl.[4] F16L *55/04*

U.S. Cl. 138—30 1 Claim



1. A hydraulic accumulator device for providing regulated hydraulic energy storage of hydraulic fluid under pressure comprising,

a pressure vessel provided with a chamber therein,

a thin-walled fluid entry cylinder disposed within said chamber,

hydraulic fluid under pressure entering said thin-walled fluid entry cylinder and communicating between an external supply and the said chamber via a plurality of ports in the wall of said vessel,

a sealable tubular diaphragm disposed within said pressure vessel,

a plurality of adjustable guides disposed within said diaphragm,

each of said guides comprising a thin-walled, elongated cylindrical element provided with a wall, space interior thereto and a plurality of apertures in said walls of said elements allowing fluid communication between the interior and exterior of said guides,

said guides disposed apart from said thin-walled fluid entry cylinder,

a pressure controlled gas disposed within said pressure vessel external to said diaphragm,

said thin-walled fluid entry cylinder disposed within said diaphragm and provided with a plurality of apertures disposed about its entire peripheral surface to permit said fluid to pass through the apertures in the thin-walled fluid entry cylinder and communicate with the interior surface of said diaphragm.

4,598,738

TUBE CLOSING DEVICE, ESPECIALLY FOR HEAT-EXCHANGER TUBES

Robert Weber, Uttenreuth, and Siegfried Förner, Erlangen, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

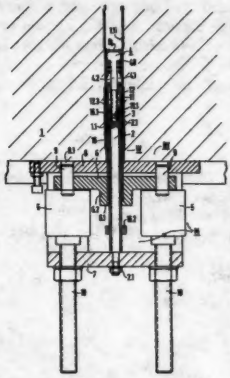
Filed Mar. 31, 1983, Ser. No. 480,853

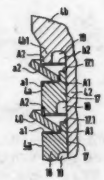
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 3212223

Int. Cl.[4] F16L *55/10*

U.S. Cl. 138—89 18 Claims

1. Tube-closing device with a tube plug having a plug casing with an enlargeable outer diameter for producing sealing surface pressure, and a plug core surrounded by the plug casing, the plug core and the plug casing being displaceable relative to one another, and a setting tool for the tube plug insertable into a respective tube to be closed for enlarging the outer diameter of the plug casing, the setting tool being couplable with the plug core through the intermediary of a detachable holding rod and engageable with the plug casing through the intermediary of a support sleeve through which the holding rod extends, the setting tool having tensioning means for producing an axial relative displacement of the holding rod and the support sleeve and, thereby, of the plug casing and the plug core, comprising coaxially disposed cuff rings, as sealing elements for the tube, said cuff rings being mounted between the plug casing and the plug core so as to have a starting, unstressed conical form with an outer diameter at most equal to the inner





diameter of the tube to be closed, and so as to be flattenable out of said conical form thereof by the relative displacement of the plug casing and the plug core so that the outer diameter thereof is enlarged and the cuff rings are made of a material that will dig slightly into the wall of the tube to be closed.

4,598,739

STRIP-WOUND HOSE

Friedrich Bürcher, Freischützstr. 17,, 8000 München 81, Fed. Rep. of Germany

Continuation of Ser. No. 460,291, Jan. 24, 1983, abandoned. This application May 7, 1985, Ser. No. 731,746

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1982, 3202516; Feb. 8, 1982, 3204244

Int. Cl.[4] F16L *11/16*

U.S. Cl. 138—135 4 Claims

1. In a strip-wound hose made up of at least one metal foil strip placed in helical turns and of a metal connection band, each of said foil strip turns having an edge portion overlapping with an edge portion of a foil strip turn next thereto in an axial direction of said hose and furthermore overlapping said connection band, the invention residing in that said connection band is S-like in transverse section with the base of the letter S

forming two pockets facing in opposite directions along the length of the hose, said edge portions being tucked from opposite sides into pockets of said connection band, said connection band having been pressed together in a radial direction with respect to the hose along lines running in the round-the-hose direction to crimp the pockets closed and firmly secure said overlapping edge portions together by said connection band, and edging tape of U-like radial cross section placed on an edge portion of said strip, said edge portion and edging tape being taken up in one of said pockets of said connection band.

4,598,740

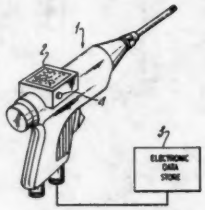
HAND TOOL WITH VISUAL DISPLAY MEANS

Frederick Sloan, 10 Waterloo Park North, Belfast, BT 15, and William Chambers, 41/42 Main Street, Groomsport, Co. Down, both of Northern Ireland

Filed Apr. 25, 1983, Ser. No. 488,238

Int. Cl.[4] B21F *3/00*

U.S. Cl. 140—124 **4 Claims**



1. A hand tool having electrically powered display means thereon, and electronic data store means providing said display means with instruction data relevant to the function for which the tool is to be used to thereby assist an operator in the use of the tool.

4,598,741

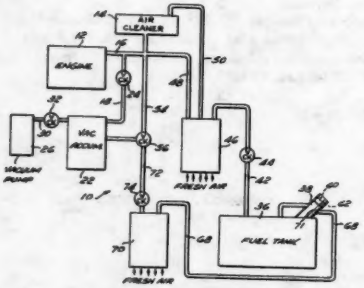
BARRIER VAPOR CONTROL SYSTEM

David C. Johnson, San Juan Capistrano, and James S. Allen, Capistrano Beach, both of Calif., assignors to D. C. Johnson & Associates, Inc., El Toro, Calif.

Filed Sep. 21, 1984, Ser. No. 652,959

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—5 **13 Claims**



13. A method for controlling vapor emissions from a motor vehicle fuel tank having a filler pipe extending therefrom while the tank receives a volatile liquid from a fuel delivery conduit, comprising the steps of:

placing a first seal adjacent one end of the filler pipe;

placing a second seal in the filler pipe spaced apart from the first seal;

collecting vapors displaced from the tank as the tank filles with the liquid, wherein said collecting step further comprises:

connecting an activated charcoal cannister to the vapor recovery conduit;

maintaining a predetermined vacuum in the vapor recovery conduit to draw vapors placed from the fuel tank into the cannister;

placing a switch in communication with the filler pipe and a vacuum pump, for actuation by insertion and removal of the fuel delivery conduit therefrom;

activating a vacuum pump with the switch to provide the vacuum to the vapor recovery conduit; placing a first seal adjacent one end of the filler pipe; and

placing a second seal in the filler pipe spaced apart from the first seal.

4,598,742

METHOD AND APPARATUS FOR MONITORING LIQUID STOCK IN A STORAGE TANK

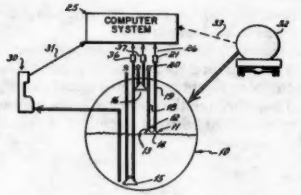
Paul R. Taylor, Market Harborough, England, assignor to Dover Corporation, New York, N.Y.

Continuation of Ser. No. 572,742, Jan. 23, 1984, abandoned. This application Nov. 4, 1985, Ser. No. 794,598

Claims priority, application United Kingdom, Apr. 14, 1983, 8310096

Int. Cl.[4] B65B *1/48;* G01F *23/26;* G01N *15/06*

U.S. Cl. 141—95 **7 Claims**



1. In a system having a liquid storage tank, and liquid dispensers connected to said storage tank, apparatus for monitoring stock movement to and from said tank comprising:

a computer;

means connecting said dispensers to said computer to continuously enter quantities of stock as it is dispensed;

at least one fixed level indicator mounted within said tank for indicating the true stock level when the stock upper-surface traverses said indicator;

said computer including means for calculating the level of stock at the time it passes said fixed level indicator, the calculation being based on the quantity of stock added to said tank and subtracted from said tank at the instant the level of stock passes said indicator, means connecting said indicator to said computer to trigger said calculating means; and

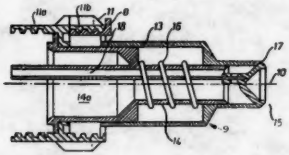
means for comparing the true stock level with a calculated stock level determined to provide a measure of the variance between said true stock level and the calculated level.

4,598,743

FILLING NOZZLE

Gunnar S. Milling, Falun, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Continuation of Ser. No. 444,739, Nov. 26, 1982, abandoned. This application Sep. 9, 1985, Ser. No. 773,859
Claims priority, application Sweden, Dec. 1, 1981, 8107170
Int. Cl.[4] B65C *3/00*; B65B *39/04*
U.S. Cl. 141—296 1 Claim



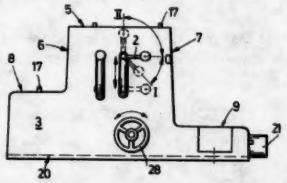
1. A fuel dispensing nozzle for a receiver having a fastening member for connecting said nozzle to an outlet of a fuel container, said fastening member having a sleeve to couple said nozzle to said outlet comprising: a fluid passageway extending through said nozzle, a valve member, biasing means to bias said valve member to a position in which flow through said passageway is prevented, and said valve member being openable against the action of said biasing means by pressing the nozzle into a filling hole, an air conduit in the form of a channel extending along the passageway through the nozzle to be opened and closed by the said valve member simultaneously with the passageway, said passageway being provided with an end opening in the container below the fuel surface in the receiver when at least a part of said nozzle and said passageway are submerged in the fuel in said receiver, said sleeve being threaded at both ends whereby either end may be screw-threaded on said outlet of the fuel container and a cap adapted to be removably attached to one end of said nozzle whereby said nozzle is adapted to be turned approximately 180 degrees relative to its longitudinal axis so that the opposite end thereof is connected to said fuel container to thereby function as a closure for said fuel container whereby fuel flows freely from said fuel container by gravity when one end of the nozzle is connected to said container and fuel flow from the container is prevented when said opposite end of the nozzle is connected to said fuel container.

4,598,744

UNIVERSAL MACHINE FOR WOOD AND/OR SYNTHETIC PLASTIC WORKING

Antonie Bons, Hameln, and Erwin Raabe, Hess.-Oldendorf, both of Fed. Rep. of Germany, assignors to Stephan-Werke GmbH, Hameln, Fed. Rep. of Germany

Filed Mar. 12, 1984, Ser. No. 589,451
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1983, 3309025
Int. Cl.[4] B27C *9/00*
U.S. Cl. 144—1 G 37 Claims



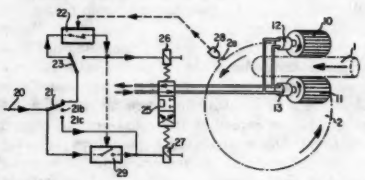
1. A universal machine for wood and/or synthetic plastic working, comprising a working motor having a motor shaft with ends formed as working spindles; means for height adjustment of said working motor; means for turning said working motor from its horizontal position to its vertical position; and a machine housing surrounding said working motor, said machine housing being limited from above by a first horizontal mounting surface and having two oppositely located first lateral walls, and a second horizontal mounting surface and a third horizontal mounting surface each associated with one of said lateral walls and located lower than said first horizontal mounting surface, said three mounting surfaces being integral components of said machine housing; a plurality of openings each provided in a lateral wall associated with said third mounting surface and in said first mounting surface, respectively, so that one of said working spindles in vertical or horizontal position of said working motor can extend therethrough, and another opening provided in a lateral wall facing toward said second mounting surface and being in alignment with the other horizontally located working spindle; centering means provided at least on said first and second mounting surfaces of said machine housing; a protective hood releasably mounted on said centering means; and at least one exchangeable independent working device releasably mountable on said centering means.

4,598,745

FEEDING WOOD CHIPPING

Jaakko Parviainen, Helsinki, Finland, assignor to Perusyhtymae Oy, Helsinki, Finland

Continuation-in-part of Ser. No. 362,271, Mar. 26, 1981, abandoned. This application Feb. 10, 1984, Ser. No. 578,972
Claims priority, application Finland, Mar. 18, 1981, 810844
Int. Cl.[4] B27L *11/02*
U.S. Cl. 144—176 3 Claims



1. A chopping apparatus comprising:

a rotatable wheel or disk carrying a plurality of cutters;

a pair of traction rollers for engaging a log and feeding the same at an oblique angle towards a cutter disk for obtaining a chopping and chipping of the log;

a pair of motors respectively for operating said rollers in a forward and in reverse mode;

control means for operating said motors respectively in the forward and reverse mode whereby the reverse mode is alternatingly interspersed in between sequential forward motion cycles to bridge a period of time in between sequential engagements of the log by the cutters;

said control means including a feed-braking unit provided for the forward mode, the feed braking unit being connected when energized to operate said motors in the forward mode; and

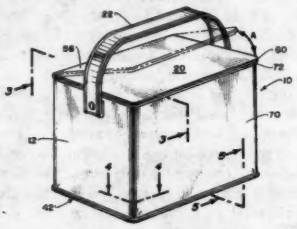
speed drop responsive means and manual means connected for deenergizing the feed braking unit thereby triggering a timing means, said timing means being connected and operating for causing the motors to run in the reverse for a specified period of time inherent in the timing means.

4,598,746

CARRYING CASE

Harold Rabinowitz, Midlothian, Va., assignor to Nappe Babcock Co., Richmond, Va.

Filed Mar. 29, 1985, Ser. No. 717,830
Int. Cl.[4] A45C 11/20; B65D 1/40, 1/48
U.S. Cl. 150—52 R 12 Claims



1. A carrying case comprising:

an endless sidewall structure having a top opening and a bottom opening consisting of an inner support means defining the three dimensional shape of said case, sidewall insulative material coextensive with and adjacent to said support means and a layer of heat sealable sidewall plastic material enclosing both said support means and said insulative material forming a flange about the outer peripheral edge of said bottom opening;

a bottom preform overlying said bottom opening consisting of reinforcement means defining the planar shape of said preform in correspondence with the bottom opening of said case, bottom insulative material adjacent said reinforcement means and, a layer of heat sealable bottom preform plastic material enclosing both said reinforcement means and said insulative material having an outwardly extending peripheral lip, said flange and lip forming a heat sealed lap joint that connects the bottom preform to said sidewall structure;

a cover overlying said top opening consisting of a first stiffening member defining the planar shape thereof in correspondence with said top opening, cover insulative material adjacent to said stiffening member including a lower thickened layer extending from said first stiffening member into the interior area of said case with a second stiffening member adjacent the underside of said lower thickened layer and an intermediate layer of heat sealable plastic material interposed between said first stiffening member and said lower thickened layer of insulative material and, a layer of heat sealable cover plastic material enclosing both of said stiffening members and said insulative material.

4,598,747

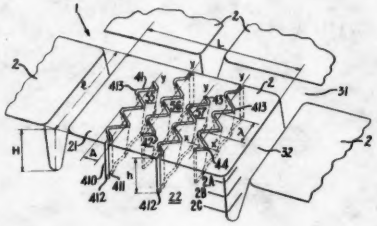
TIRE TREAD RELIEF ELEMENTS HAVING UNDULATED OR BROKEN LINE INCISIONS

Charles Flechtner, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Continuation of Ser. No. 592,592, Mar. 23, 1984, abandoned. This application Apr. 9, 1985, Ser. No. 721,295
Claims priority, application France, Apr. 12, 1983, 83 06072
Int. Cl.[4] B60C 11/12
U.S. Cl. 152—209 R 10 Claims

1. A tire tread comprising elements in relief which are provided with undulated or broken line incisions of a wavelength and an amplitude which are small as compared with the dimensions of the elements in relief, characterized by the fact that the incisions have smaller amplitudes at the bottom of the incisions than at the surface of the tread, the amplitudes, starting from the surface of the tread, decreasing linearly as a function of the depth.

2. A tire tread comprising elements in relief which are provided with undulated or broken line incisions of a wavelength and an amplitude which are small as compared with the dimensions of the elements in relief, characterized by the fact that the incisions have smaller amplitudes at the bottom of the incisions than at the surface of the tread, the amplitudes, starting from the surface of the tread, being constant over a depth less than the depth of the incisions and then decreasing linearly to the bottom of the incisions.

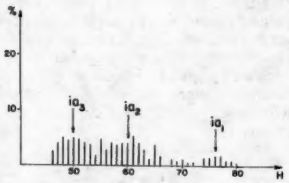


4,598,748

REDUCTION OF THE TRAVEL NOISE OF TIRES

Francis Campos, Clermont-Ferrand, and Yves Herbelleau, Riom, both of France, assignors to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Feb. 23, 1984, Ser. No. 582,838
Claims priority, application France, Mar. 3, 1983, 83 03662
Int. Cl.[4] B60C 11/11
U.S. Cl. 152—209 R 17 Claims



1. A tire whose tread is formed of load-bearing elements distributed over the circumference of the tire in accordance with a plurality of repetitive design cycles of variable pitch, characterized by the fact that the number of each of the principal design cycles of different pitch satisfies all of the n−1 general relationships (B):

$$\frac{1}{(\lambda_i)1.5} \leq \frac{N_i}{N_n} \leq \frac{1}{(\lambda_i)3}$$

and by the fact that the number of each of the design cycles present on the tread satisfies the relationship (C):

$$\sum_{i=1}^{i=n} N\mu_i + \sum_{j=1}^{j=m} N^*\mu^*_j = 2\pi R \pm \epsilon$$

it being understood that

$$\sum_{j=1}^{j=m} N^*\mu^*_j$$

and/or ϵ may each be equal to zero,

n represents the number of principal design cycles of different pitch present on the tread of the tire, which is a whole number at least equal to 3, preferably from 4 to 7, and it also designates the principal design cycle having the maximum pitch,

m represents the number of looping design cycles of different pitch present on the tread of the tire, which may be either zero or a whole number, and it also designates the looping design cycle having the maximum pitch,

i represents any one, the i^{th}, of the principal design cycles of rank i other than that of maximum pitch,

j represents any one, the j^{th}, of the looping design cycles of rank j,

λ_i represents the pitch ratio of the length of each of the principal design cycles of rank i in question to the length of the principal design cycle of maximum pitch,

R represents the radius of the tire measured at the periphery of the tread which comes into contact with the surface of the ground,

ϵ represents the tolerance in the production of the design cycles on the circumference of the tire,

a_i represents the length of the principal design cycle of rank i in question of the principal design cycles of different pitch,

a^*_j represents the length of the looping design cycle of rank j in question of the looping design cycles of different pitch,

N_n represents the total number of principal design cycles of maximum pitch,

N_i represents, for each of the principal design cycles of rank i having a pitch less than the pitch of the principal design cycle of maximum pitch, the total number of principal design cycles of rank i, and

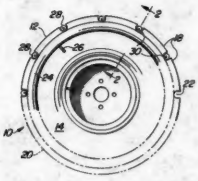
N^*_j represents the total number of looping design cycles of each of the cycles of rank j in question.

4,598,749

VEHICLE TIRE WITH TRACTION MEANS

Anthony V. Mandekic, 5694 Lone Pine Cyn. Rd., Wrightwood, Calif. 92397

Filed Jan. 14, 1985, Ser. No. 691,318
Int. Cl.[4] B60C *27/12, 5/20, 11/18*
U.S. Cl. 152—210 **3 Claims**



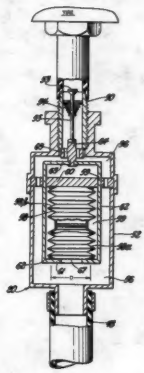
1. A vehicle tire having a tread and opposite sidewalls, said tread having an annular road-engaging surface interrupted by a purality of uniformly circumferentially spaced apart, radially outwardly opening cross grooves extending from sidewall to sidewall, a traction-improving device comprising a pluraltiy of fluid-inflatable and -deflatable cross members, one receivable in each groove to extend end-to-end thereof and so dimensioned as to lie in retracted position below the road-engaging surface when deflated and to project beyond said surface when inflated, an annular fluid-inflatable and -deflatable manifold having means for the concentric affixation thereof to one end of the sidewalls, said manifold having a fluid inlet and outlet valve disposed radially inwardly of the manifold and accessible at said one sidewall for the selective pressurizing and depressurizing said manifold, and a plurality of fluid conduit means connected in parallel fluid flow relationship between the manifold and the cross members.

4,598,750

TIRE INFLATION/DEFLATION SYSTEM

Lawrence A. Gant, 1027 Harvard, Gross Pointe Park, Mich. 48230

Filed Nov. 16, 1984, Ser. No. 672,056
Int. Cl.[4] B60C *23/00*
U.S. Cl. 152—416 **1 Claim**



1. In a centrally controlled tire inflation/deflation system for a multi-wheeled vehicle, wherein said system comprises a central air pressure source, air passage means between said source and each tire for adding air thereto or withdrawing air therefrom; a check valve at each tire for controlling air flow between the tire and said air passage means, and pressure-responsive control mechanism at each tire for operating the associated check valve between its open and closed positions:

the improvement wherein each check valve comprises a valve housing permanently carried by the associated wheel-tire assembly, a depressible check valve element (53) located within the valve housing, and a compression spring (54) acting on the check valve element to move said element outwardly in the housing, to thereby prevent air flow between the tire and air passage system;

each said pressure-responsive control mechanism comprising a housing structure (52) having a screw-on connection with the associated valve housing, said housing structure defining a chamber (56) operatively positioned between the air passage means and the associated check valve, a sealed pressure-responsive bellows unit (58) operatively located within said chamber in axial alignment with the associated check valve element (53), said bellows unit having a first stationary end wall (at 60) proximate to said check valve element and a second movable end wall (67) remote from the check valve element, a movable valve element depressor (64) located within said housing structure (52) in the space between the stationary end wall of the bellows unit and the depressible check valve element (53), and a strap means (62) operatively connecting the movable end wall of the bellows unit to the valve element depressor;

each bellows unit having an effective working area (D) that is several times the flow area of the associated check valve;

the at-rest pressure within each bellows unit being such that when the chamber (56) pressure is a specified amount above the bellows unit internal pressure the depressor is enabled to operate the associated check valve element (53) to an open position.

4,598,751

FOLDING WALL

Petrus J. Peeters-Weem, Oosterhout, Netherlands, assignor to 501 Pella B. V. Pannigen, Netherlands

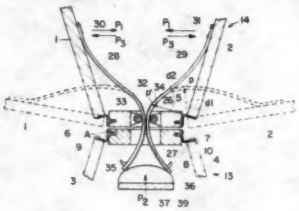
PCT No. PCT/NL81/00011, § 371 Date Dec. 4, 1981, § 102(e) Date Dec. 4, 1981, PCT Pub. No. WO81/03043, PCT Pub. Date Oct. 29, 1981

Continuation of Ser. No. 542,091, Oct. 17, 1983, abandoned, which is a continuation of Ser. No. 328,584, filed as PCT NL81/00011, on Apr. 14, 1981, published as WO81/03043, on Oct. 29, 1981, abandoned. This PCT application Apr. 14, 1981. Ser. No. 665,080

Claims priority, application Netherlands, Apr. 15, 1980, 8002187

Int. Cl.[4] E06B *3/94*

U.S. Cl. 160—84 R 21 Claims



17. In a folding wall, the structure comprising the combination of first and second panels, first coupling means extending between said panels and hinge means for pivotally connecting said panels to said first coupling means about first and second axes which are disposed in spaced parallelism, said first coupling means having an opening therethrough, a first spring blade connected at one end thereof to said first panel at a position spaced from said hinge means, a second spring blade connected at one end thereof to said second panel at a position spaced from said hinge means, and guide means carried by said first coupling means between said axes and within said opening for receiving and guiding said spring blades in convergent relation to a point of contact disposed beyond said guide means with respect to said panels.

4,598,752

GUIDE ELEMENT ESPECIALLY SUITABLE FOR SOLAR GREENHOUSES AND THE LIKE AND PARTICULARLY UTILIZABLE FOR CONTROLLED SHADING

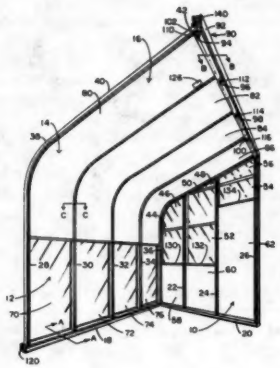
Chris Esposito, W. Bayshore, N.Y., assignor to Four Seasons Solar Products Corporation, Farmingdale, N.Y.

Continuation-in-part of Ser. No. 455,475, Jan. 4, 1983. This application Mar. 21, 1984, Ser. No. 591,959

Int. Cl.[4] A47H *3/00*

U.S. Cl. 160—272 8 Claims

1. Apparatus comprising spaced parallel bars defining parallel channel tracks with facing mouths, a shade extending laterally through said mouths and including bulbous peripheries accommodated and retained in said tracks, said bars including ends at which said shade selectively enters and exits said tracks, roller means operatively associated with said ends to take up and play out said shade, said roller means being displaced from said bars, and guide means to guide a change in direction of said shade as the shade enters or exits the tracks to adapt the shade to the relative positions of said roller means and the ends of the bars, said guide means being provided with open guide tracks for receiving said bulbous peripheries, said guide tracks being of arcuate configuration to change direction of the bulbous peripheries and thereby of said shade, said guide tracks having proximal lateral guide walls which slope apart in



the direction of the ends of said bars whereby to effect a stretching of the shade.

4,598,753

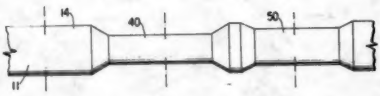
METHOD FOR PRESSING FINLESS SEWING MACHINE NEEDLES

Thaddeus J. Zylbert, Morris Plains, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Oct. 9, 1984, Ser. No. 658,726

Int. Cl.[4] B21G *1/04*

U.S. Cl. 163—5 4 Claims



1. The method of fabricating a sewing machine needle having a butt portion, a blade extending from said butt portion, a needle eye extending through said blade, a tapered point adjacent said needle eye, and a clearance above the eye defined by a recess in one side of said blade between the eye and the butt portion comprising the steps of:

preparing a cylindrical blank with varying cross-sectional area along its length,

providing shaped dies for pressing said needle blank into the finished shape of the needle,

orienting the prepared blank lengthwise relatively to said shaped dies,

subjecting the needle blank to deformation by pressing with said shaped dies finlessly into the finished shape of the needle with exception of the needle eye and the tapered point, said cross-sectional area of said cylindrical blank being sized along its length so that there is an absence of excess metal upon deformation of said needle blank into said finished shape to obviate the formation of a fin, punching the needle eye, and

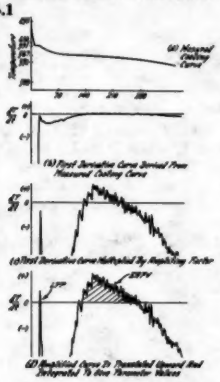
grinding only that portion of said needle blade adjacent to said eve to form said tapered point.

4,598,754

METHOD OF CONTROLLING METALLURGICAL STRUCTURE OF CAST ALUMINUM

Chia-Ming Yen, West Bloomfield; Gerald S. Cole, Franklin, and Roman M. Nowicki, Bloomfield Hills, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 30, 1984, Ser. No. 635,951
Int. Cl.[4] B22D *27/00, 46/00*
U.S. Cl. 164—4.1 13 Claims



1. A method of controlling the metallurgical structure of cast metals containing nonmetallic second phase structures, comprising:

(a) prior to casting a melt of said metal, determining a mathematical value based on the rate of temperature change at liquidus recalescence and a value based on the rate of temperature change at the eutectic arrest of a measured cooling curve for a sample of said metal melt, said values being determined by (1) recording temperature variation as a function of time during solidification of said sample, (2) taking the first derivative of said variation to represent the rate of temperature change, (3) amplifying and clarifying said first derivative to define a domain of analysis about the liquidus recalescence and/or the eutectic arrest, and (4) integrating the domain of analyses to render said mathematical values;

(b) comparing the determined value based on liquidus recalescence and the determined value based on eutectic arrest with previously gathered values of the same type that have been correlated to known metallurgical structures; and

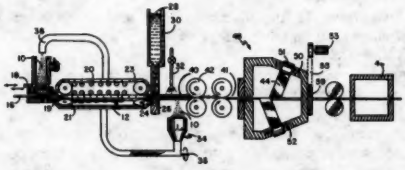
(c) if one or both of said determined values are different than the previously gathered values for a desired similar structure, respectively, add refining and/or eutectic modifying agents to the melt to promote a desired metallurgical structure change.

4,598,755

METHOD OF PRODUCING A WRAPPED CONTINUOUS LENGTH STRUCTURE

Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081

Filed May 28, 1985, Ser. No. 738,403
Int. Cl.[4] B22C *9/10;* B22D *11/00, 11/12*
U.S. Cl. 164—5 10 Claims



1. A process for making a continuously-produced structure comprising the steps of:

continuously molding green sand to form a molded green sand core;

forming a mold pattern in said core;

pouring molten material in the mold pattern formed in said green sand core;

solidifying said poured material;

removing said green sand from said solidified material structure;

wrapping said solidified structure with wrapping material; and

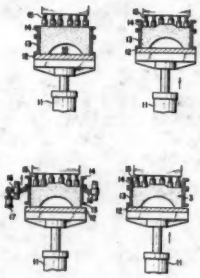
treating said wrapped structure to strengthen said wrapping material.

4,598,756

METHOD FOR MAKING SAND MOLDS

Masao Fuchigami, Yawata, and Yuichi Matsuo, Hirakata, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sep. 4, 1984, Ser. No. 647,198
Int. Cl.[4] B22D *15/00*
U.S. Cl. 164—37 6 Claims



1. A method of making a sand mold with mold sand in a mold frame surrounding a pattern resting on a pattern plate at the pattern plate side of the mold, the pattern plate extending beyond the periphery of the mold frame and forming a support for the mold frame and a closure for the bottom side of the mold, the mold frame at the top side of the mold, opposite to the pattern side, being open and a squeeze head means above the open top of said mold, the steps comprising, lifting said mold frame, with said sand and said pattern therein, with said pattern plate to engage the top surface of the mold sand therein with said squeeze head means, continuing said lifting of said mold frame, said mold sand and said pattern until said mold sand is squeezed in said mold frame not less than fifty (50) percent of the full squeeze stroke, stopping said lifting of said pattern plate, said mold frame, said mold sand and said pattern and, without moving said pattern plate, said mold sand or said pattern relative to each other, forming a gap between the bottom end of said mold frame and said pattern plate a distance slightly greater than the remainder of said full squeeze stroke and, with said bottom end of said mold frame and said pattern plate separated, advancing said pattern plate toward said mold frame the remainder of said full squeeze stroke to squeeze the bottom of said sand mold.

4,598,757

BONDED SAND SPRUE CUP

Francis V. Bailey, Racine, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 26, 1984, Ser. No. 634,599
Int. Cl.[4] B22D *33/04*
U.S. Cl. 164—137 13 Claims

11. A casting process comprising the steps of fabricating a disposable sprue cup consisting essentially of bonded sand including a binder and unbound sand, the sprue cup including an enlarged cup portion adapted to receive molten metal and an elongated neck portion extending downwardly from the cup portion when the sprue cup is oriented for casting, attach-

ing the sprue cup to a foam mold pattern having a sprue by extending the sprue into the neck portion of the sprue cup, embedding the foam mold pattern and a portion of the attached sprue cup in unbound sand, and pouring molten metal into the sprue cup so that the molten metal received in the cup portion

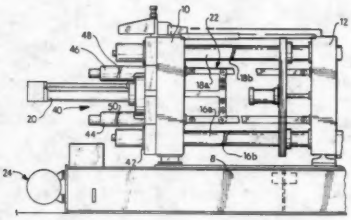
flows within the neck portion to the sprue of the mold pattern, whereby, after completion of said pouring step, the binder of the sprue cup disintegrates in response to heat received during the casting process, thereby leaving essentially unbound sand that does not conteminate the unbound sand embedding the foam mold pattern.

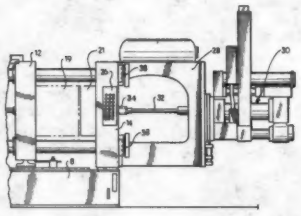
4,598,758

MOTOR CONTROLLED TIE BAR SYSTEM FOR DIE-CASTING MACHINE

Lloyd A. Nyland, Macatawa, and Berend Klompmaker, Holland, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Aug. 8, 1983, Ser. No. 520,949
Int. Cl.[4] B22D *17/26, 17/32*
U.S. Cl. 164—154 **4 Claims**





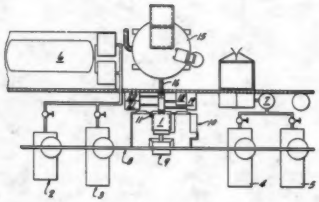
1. In a clamp type machine with spaced apart front and rear platens and a movable platen therebetween for positioning die tools and including associated tie bars each having a threaded tie bar nut connected thereon for adjusting tie bar tension the improvement comprising; a plurality of electric drive motors each having an output shaft, a drive motor gear fixed to each output shaft and continuously meshed with one of the tie bar nuts, motor control circuit means for independently or simultaneously energizing each of said drive motors, means for synchronizing the drive of each of said drive motors when simultaneously energized, a programmable logic control means having input means and output means, selector switch means to input the input means of said logic control means to a manual mode and an automatic mode, and switch means associated with said motor control circuit means responsive to the output means of said logic control means when in an automatic mode to simultaneously energize one or more of said electric drive motors to produce adjustment of individual ones of the tie bars or all of the tie bars to compensate for uneven die tool expansion caused by uneven heat built-up in the die tool.

4,598,759

APPARATUS FOR AUTOMATED MIXING AND TRANSPORT OF CHEMICALLY BONDED SAND MIXTURES FOR CASTING

James J. Allread, Hartland, and Donald C. Lenz, Mukwonago, both of Wis., assignors to Grede Foundries Inc., Milwaukee, Wis.

Filed Jan. 20, 1984, Ser. No. 572,353
Int. Cl.[4] B22C *5/04, 25/00*
U.S. Cl. 164—155 **18 Claims**



1. Apparatus for making cores or molds for sand casting comprising a plurality of core machines located in a predetermined array, a mixer adapted to create a sand mix of a core sand and a sand binder in accordance with anyone of a plurality of predetermined recipes, each of said core machines having a demand signal source operable to create a demand for one of the recipes, transport means movable in a pattern between the mixer and all of said core machines, and a logic controller coupled to said core machines to respond to a demand for a recipe and having means to identify the recipe for a particular core machine and to actuate the mixer to develop a sand mix in accordance with said recipe and thereafter deliver said sand mix to the appropriate core machine.

4,598,760

CLEANING ROLLER TRACKS OF WITHDRAWAL STANDS IN MACHINES FOR CONTINUOUS CASTING

Rainer Lenk, Duisburg; Harald Neuhaus, Essen, and Jürgen Warner, Duisburg, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed May 3, 1982, Ser. No. 374,099
Claims priority, application Fed. Rep. of Germany, May 8, 1981, 3118977
Int. Cl.[4] B22D *11/00*
U.S. Cl. 164—158 **4 Claims**

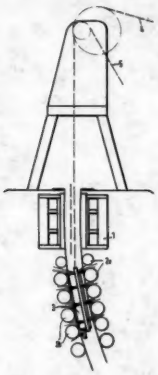
1. An apparatus for cleaning roller tracks in machines for continuous casting, comprising:

a frame;

means for moving the frame in between the roller tracks in one or an opposite direction, along the extension of the roller track;

tubes for conducting cleaning fluid and being disposed on the frame and provided for moving laterally in opposite directions extending transversely to said direction for

moving the frame, the tubes being laterally protracted and retracted from the frame accordingly; and



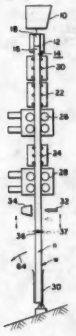
spray means arranged at ends of the tubes for dispensing the cleaning fluid towards rollers of the track.

4,598,761

VERTICAL TYPE CONTINUOUS CASTING APPARATUS HAVING A TORCH CUTTER

Yoshinobu Ishihara, Osaka; Kazuya Minami, and Shuntaro Matsumoto, both of Hyogo, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Dec. 29, 1983, Ser. No. 566,703
Int. Cl.[4] B22D *11/126*; B23K *7/02*
U.S. Cl. 164—263 **12 Claims**



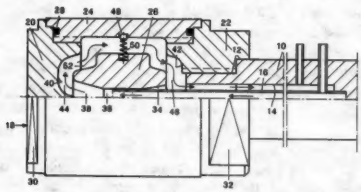
1. A vertical type continuous casting apparatus, comprising:
gas cutting means having a torch for gas cutting a cast strand, said gas cutting means being movable downwardly together with a cut portion of the cast strand;
movable receiving means open adjacent said torch for receiving sludge and combustion gas;
sludge discharge means for discharging said sludge;
suction means for suctioning combustion gas, said discharge means and said suction means being connected to said receiving means; and
synchronous descending means for moving said receiving means downwardly in synchronism with vertical downward movement of said gas cutting means wherein said movable receiving means further comprises a hood forwardly openable opposite a blow-out port of said torch in a blowing direction of said torch.

4,598,762

PLUNGER FOR A CASTING MACHINE

Friedrich Glas, Siebenbürger Str. 30, D-8192 Geretsried, Fed. Rep. of Germany

Filed Feb. 1, 1984, Ser. No. 575,983
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1983, 3305594
Int. Cl.[4] B22D *17/20*
U.S. Cl. 164—312 **10 Claims**



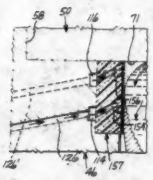
1. An improvement in a plunger in a die casting machine of the cold chamber type, the plunger comprising a front wall, a peripheral wall, a hollow shaft fastened to the plunger, a cooling liquid feed pipe, having a front opening, arranged within the hollow shaft leaving a circular discharge channel therebetween and projecting axially beyond the hollow shaft, a tube-like body arranged within the plunger and leaving an annular chamber between said peripheral wall and the tube-like body, the annular chamber communicating at axially opposite ends with the front opening of the feed pipe and the discharge channel respectively, the improvement comprising said tube-like body formed as a mouth piece spaced from the front wall of the plunger, a front end flow chamber formed between the front wall of the plunger and a front end face of the mouth piece, at least two small peripherally spaced holding means connecting the mouth piece and the plunger and holding the mouth piece coaxially aligned with said plunger, the annular chamber communicating at least substantially around its whole circumference thereof with both the front end flow chamber and the discharge channel.

4,598,763

DIRECT CHILL METAL CASTING APPARATUS AND TECHNIQUE

Frank E. Wagstaff; William G. Wagstaff, and Richard J. Collins, all of Spokane, Wash., assignors to Wagstaff Engineering, Inc., Spokane, Wash.

Continuation of Ser. No. 435,476, Oct. 20, 1982, abandoned.
This application Mar. 8, 1985, Ser. No. 708,387
Int. Cl.[4] B22D *11/07, 11/124*
U.S. Cl. 164—472 **25 Claims**



1. In the process of direct chill casting a metal in an open ended mold cavity having a support telescoped in the discharge end thereof and an opening at the other end thereof whose diameter is smaller than the peripheral wall of the cav-

ity so that the inner peripheral edge of said other end opening forms an overhang relatively over the wall, the steps of:

continuously filling said other end opening of the cavity with molten metal so that the mass of molten metal splays about the inner peripheral edge of the other end opening and forms a body of molten metal in the cavity whose cross-section has a divergent/convergent outline between the ends thereof, the intermediate continuum of which between the planes of maximum divergence and minimum convergence thereof, has a peripheral outline corresponding generally to the outline of the cavity at the peripheral wall thereof,

circumposing graphite or graphite-like wall defining means about the molten metal body in the peripheral wall of the cavity at a level below the overhang adapted so that the intermediate continuum is surrounded by a solid but fluid permeable wall section of said means,

simultaneously forcing a lubricating oil and an additional fluid medium selected from the group consisting of a highly heat vaporizable liquid medium and a gaseous medium, through the fluid permeable wall section so that the oil and additional fluid medium discharge into the cavity at points on the inner peripheral surface of the wall section opposite the intermediate continuum, and

simultaneously chilling the molten metal body from points below the intermediate continuum and reciprocating the mold and support in relation to one another endwise of the cavity to elongate the body,

the wall of the cavity co-terminating with the overhang at the aforesaid other end of the cavity so that the part of the molten metal body directly adjacent the overhang is surrounded by a closed corner of the cavity, and

the fluid thus discharged about the intermediate continuum forming an annulus of fluid tending to flow relatively away from the closed corner of the cavity toward the discharge end thereof.

4,598,764

REFRIGERATION HEAT PUMP AND AUXILIARY HEATING APPARATUS CONTROL SYSTEM WITH SWITCHOVER DURING LOW OUTDOOR TEMPERATURE

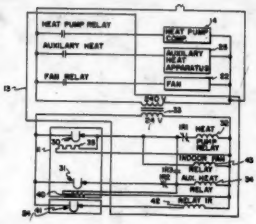
Thomas J. Beckey, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

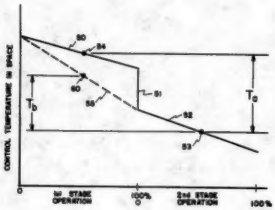
Filed Oct. 9, 1984, Ser. No. 658,855
Int. Cl.[4] F25B *29/00*
U.S. Cl. 165—29 **5 Claims**

1. An improvement in a control system having a multistage space thermostat with a first stage adapted to control a refrigeration heat pump apparatus and with a second stage adapted to control an auxiliary heating apparatus and having an outdoor temperature responsive means responsive to outdoor temperature for disconnecting the heat pump from the first stage to render the heat pump inoperative and connecting the auxiliary heat to be controlled by the first stage when the outdoor temperature is below a predetermined value, the improvement comprising

anticipation means for each of said first and second stages of said space thermostat, and

means connected to the outdoor temperature responsive means to connect said anticipation means of each of said stages to be controlled by said first stage at a predetermined outdoor temperature when said auxiliary heating apparatus is controlled by said first stage to reduce the abrupt change in controlled space temperature by the





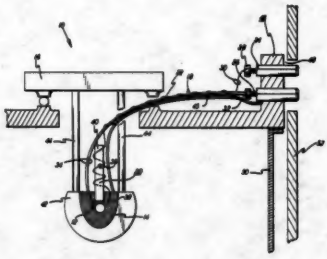
transfer of the control of auxiliary heat from said second stage to said first stage.

4,598,765

SAMPLE CELL TEMPERATURE STABILIZER

John Atwood, Redding; Charles Helms, Trumbull, and Raymond P. W. Scott, Wilton, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 3, 1984, Ser. No. 576,585
Int. Cl.[4] F25B *29/00*
U.S. Cl. 165—66 **6 Claims**



1. In a liquid chromatograph a thermal equilibrating apparatus for equilibrating the temperature of liquid as it passes through a flow cell comprising, in combination:

a flow cell housing having an inlet port and an outlet port through which liquid can pass from said inlet port to said outlet port;

an outlet conduit in fluid communication with said outlet port for conducting away fluid exiting from said outlet port;

an inlet conduit coupled to said inlet port and of a smaller diameter than said outlet conduit for conducting fluid into said inlet port, said inlet conduit being coiled around and in thermal transfer relationship with said outlet conduit along a portion of the length thereof; and

means in direct thermal transfer relationship with said flow cell housing around which said inlet conduit is coiled in a thermal transfer relationship therewith and disposed between the point of separation of said inlet conduit from said outlet conduit and the connection of said inlet conduit to said inlet port.

4,598,766

COLUMN-TYPE REGENERATIVE GAS-GAS HEAT EXCHANGER WITH HEAT-TRANSFERRING ELEMENTS

Stanislaw Michalak, Reichshof, and Bernd Hermann, Gummersbach-Rebbelroth, both of Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

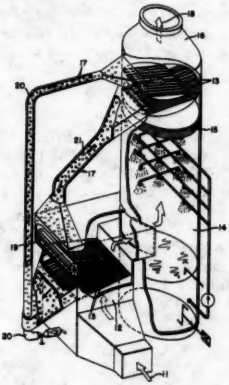
Filed Sep. 22, 1982, Ser. No. 421,485

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1982, 3214958

The portion of the term of this patent subsequent to Nov. 30, 1999, has been disclaimed.

Int. Cl.[4] F28D *19/02*

U.S. Cl. 165—104.16 **3 Claims**



1. A column-type regenerative gas-gas heat exchanger which renders possible an intensive heat exchange between a hot gas flow and a cold gas flow and which is provided with heat-transferring elements which absorb heat from hot gas, and give off heat to cold gas, said heat exchanger in combination comprising:

a first column part;

a second column part separate from said first column part, each of said column parts including a gas-permeable column bottom with one of the parts being accommodated in hot gas flow as well as the other part being accommodated in cold gas flow and each being provided with at least one gas-permeable plate; said second column part being located above said first column part when viewed in the direction of gas flow, which flows in an upward direction through said gas-permeable plates of said column parts; said heat-transferring elements forming a fluidized bed in said first and second column parts during operation, and being cyclically conveyed from said second column part to said first column part; said fluidized bed moving counter-cross current to said gas flow and over said gas-permeable plates of said column parts, said heat transferring elements on one hand being light enough that they from a whirl layer of said fluidized bed above the gas-permeable column bottom which makes possible a transporting of said heat transferring elements from above to the bottom via said second column part and on the other hand a heaped bulk layer with said heat transferring elements being heavy enough so that energy during collision and during friction is sufficient for a continuous self-cleaning of said heat transferring elements during operation; and

said heat exchanger being in communication with a wet scrubber for exhaust gases having a vertically elongated casing having an inlet at the bottom and an outlet at the top, with said second column part being arranged above said scrubber and with said first column part being arranged before the said scrubber when viewed in the direction of gas flow; said whirl layer moving in counter-cross flow relative to gas flowing from below to above through said gas-permeable column bottom.

4,598,767

MULTIPLE PRESSURE CONDENSER FOR STEAM TURBINES, WITH HEATING DEVICES FOR SUPPRESSING CONDENSATE OVERCOOLING

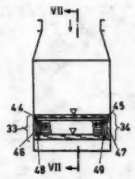
Abdel Saleh, Rheinstrasse 30, D-7891 Hohentengen, Fed. Rep. of Germany

Filed May 22, 1984, Ser. No. 613,021

Claims priority, application Switzerland, Jun. 9, 1983, 3163/83

Int. Cl.[4] F28B *9/08, 9/10*

U.S. Cl. 165—113 **4 Claims**



1. In a multiple pressure condenser for steam turbines of the type including a first low pressure condenser unit for receiving exhaust steam that is overcooled and a second intermediate condenser unit for receiving exhaust steam that is at least at a saturation temperature, the improvement comprising:

a hot well;

an intermediate floor separating the hot well from an exhaust steam space, said floor having condensate drain openings;

a plurality of heating units, each heating unit including a multiplicity of stacked droplet plates located beneath said intermediate floor and being separated from each other, each of said droplet plates being perforated and having rims along their edges;

first drain ducts extending downwardly from said first and second condenser;

a second drain duct extending upwardly and connected to said first drain ducts, said second duct extending upwardly to the level of the highest droplet plate;

an air collection duct in communication with said hot well via a perforated wall; and

at least one air extraction pipe located above said stacked droplet plates.

4,598,768

MULTI-SHELL HEAT EXCHANGER

Moses Tenne, 1351 Dubarry, Houston, Tex. 77018 (now by change of name from Moise Tenne)

Filed Jun. 11, 1984, Ser. No. 619,040

Int. Cl.[4] F28F *7/00*

U.S. Cl. 165—165 **10 Claims**

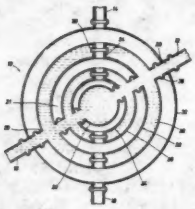
1. A multi-shell heat exchanger, comprising:

(a) a multiplicity of interconnected shells arranged one within the other, said shells including an innermost shell defining an enclosed space therein, said innermost shell being enclosed by a plurality of successively larger shells;

(b) means supporting said shells in spaced relation so as to define annular flow spaces between said shells;

(c) first fluid passage means defined at least in part by connector means forming a first continuous flow path for a cooling fluid circulating through said shells; and

(d) second fluid passage means defined at least in part by



connector means forming a second continuous and separate flow path for a heated fluid circulating through said shells, said heated fluid being cooled by heat transfer between the heated fluid and the cooling fluid occuring across said shells.

4,598,769

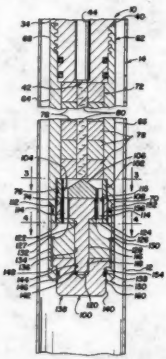
PIPE CUTTING APPARATUS

Michael C. Robertson, 904 Valley Ct., Arlington, Tex. 76013

Filed Jan. 7, 1985, Ser. No. 689,399

Int. Cl.[4] E21B *29/00, 29/02*

U.S. Cl. 166—55 **16 Claims**



1. Apparatus for cutting a pipe disposed in a pipe string extending from the surface of the earth down a borehole, comprising: a body having an elongate axis and adapted to be lowered at a first end down the pipe string to the pipe to be cut, to support a quantity of solid combustible material for providing a pipe cutting flame and to direct the pipe cutting flame along the elongate axis toward a second end of said body; and nozzle means connected to the second end of said body for directing the pipe cutting flame from the elongate axis of said body radially against the pipe to be cut, said nozzle means including a diverter made of heat resistant material, the diverter having a shoulder to receive the pipe cutting flame directed along the elongate axis of said body and to direct the pipe cutting flame radially of the elongate axis of said body.

4,598,770

THERMAL RECOVERY METHOD FOR VISCOUS OIL

Winston R. Shu, Dallas, and Kathy J. Hartman, Arlington, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

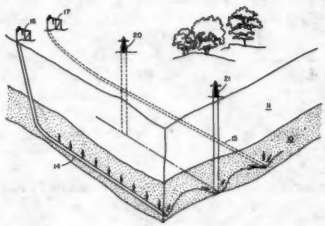
Filed Oct. 25, 1984, Ser. No. 664,740

Int. Cl.[4] E21B *43/24*

U.S. Cl. 166—245 **2 Claims**

1. In a method for the enhanced recovery of a viscous oil from a subterranean, oil-bearing formation by injecting steam into the formation through at least one injection well and producing oil from a plurality of separate producing wells situated at an offset from the injection well, the improvement which comprises

(a) a plurality of substantially parallel horizontal production wells, and



(b) a plurality of vertical injection wells located between each pair of adjacent parallel horizontal production wells and spaced apart along the center line between each of said pairs of parallel horizontal production wells at distances equal to the separation of said parallel horizontal production wells.

4,598,771

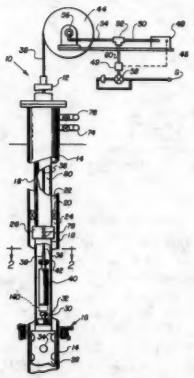
METHOD AND APPARATUS FOR FIRING A PERFORATING GUN AND SIMULTANEOUSLY RECORDING THE DOWNHOLE PRESSURE

Roy R. Vann, Katy, Tex., assignor to Geo Vann, Inc., Houston, Tex.

Division of Ser. No. 453,994, Dec. 28, 1982, abandoned, which is a continuation-in-part of Ser. No. 236,869, Feb. 23, 1981, abandoned. This application Feb. 28, 1985, Ser. No. 706,587

Int. Cl.[4] E21B *43/11, 47/06*

U.S. Cl. 166—250 **8 Claims**



1. In a cased borehole which penetrates a hydrocarbon-containing formation, the method of perforating the casing while measuring the downhole pressure adjacent to the formation, comprising the steps of:

positioning a perforating gun within the casing adjacent to the formation to be completed, the perforating gun being connected to one end of a string of tubing;

attaching a downhole end of a gun firing mechanism to a downhole end of a flow tube;

connecting an uphole end of said flow tube to a pressurized fluid source;

lowering said gun firing mechanism into the borehole

through the string of tubing connected to the perforating gun;

establishing a flow of fluid through said flow tube into the borehole;

measuring the flow and pressure of the fluid at the uphole end of said flow tube and determining the pressure at the downhole end thereof; and

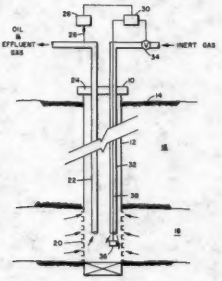
manipulating the flow tube to fire the perforating gun and simultaneously measuring downhole pressure.

4,598,772

METHOD FOR OPERATING A PRODUCTION WELL IN AN OXYGEN DRIVEN IN-SITU COMBUSTION OIL RECOVERY PROCESS

Billy G. Holmes, Lancaster, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 28, 1983, Ser. No. 566,373
Int. Cl.[4] E21B *43/243, 47/06*
U.S. Cl. 166—251 **8 Claims**



1. A method for recovering viscous oil from a subterranean, viscous oil-containing formation penetrated by at least one injection well and one production well and having fluid communication therebetween comprising:

a. establishing an in-situ combustion operation in the formation by injecting substantially pure oxygen into the formation via the injection well and recovering fluids including oil and an effluent gas from the formation via the production well;

b. continuously injecting nitrogen at a predetermined low injection rate into the lower portion of the production well;

c. continuously analyzing the effluent gas for oxygen concentration and monitoring the bottomhole temperature of the production well;

d. increasing said injection rate of said nitrogen gas to a maximum rate in the event the oxygen concentration of said effluent gas increases to a predetermined concentration or the bottomhole temperature increases to a predetermined temperature indicating a hazardous condition; and

e. continuing injection of said nitrogen at a maximum rate until the oxygen concentration of the effluent gas and the bottomhole temperature are reduced to a safe level.

5. A method for recovering viscous oil from a subterranean, viscous oil-containing formation penetrated by at least one injection well and one production well and having fluid communication therebetween comprising:

a. establishing an in-situ combustion operation in the formation by injecting substantially pure oxygen into the formation via the injection well and recovering fluids including oil and an effluent gas from the formation via the production well;

b. continuously injecting carbon dioxide at a predetermined low injection rate into the lower portion of the production well;

c. continuously analyzing the effluent gas for oxygen concentration and monitoring the bottomhole temperature of the production well;

d. increasing said injection rate of said carbon dioxide to a maximum rate in the event the oxygen concentration of said effluent gas increases to a predetermined concentration or the bottomhole temperature increases to a predetermined temperature indicating a hazardous condition; and

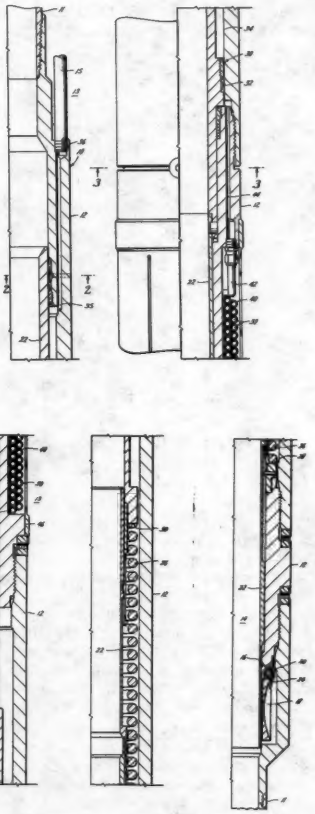
e. continuing injection of said carbon dioxide at a maximum rate until the oxygen concentration of the effluent gas and the bottomhole temperature are reduced to a safe level.

4,598,773

FAIL-SAFE WELL SAFETY VALVE AND METHOD

Ronald E. Pringle, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Continuation-in-part of Ser. No. 588,609, Mar. 12, 1984, Pat. No. 4,495,998, and Ser. No. 580,484, Feb. 15, 1984. This application Dec. 4, 1984, Ser. No. 678,125
Int. Cl.[4] E21B *34/10*
U.S. Cl. 166—373 **10 Claims**



6. The method of compensating for the effects of hydrostatic head on a well tool operated in a well by a piston and cylinder

assembly and actuated by a hydraulic fluid control line connected to one side of the assembly and extending to the well surface and comprising,

exposing the second side of the assembly to a fluid column outside of the well tool having substantially the same hydrostatic head as the head in the control line, and

the fluid column having a greater volume of fluid than the volume of hydraulic fluid in the control line whereby exposure of the fluid column to gas will not substantially change its density.

4,598,774

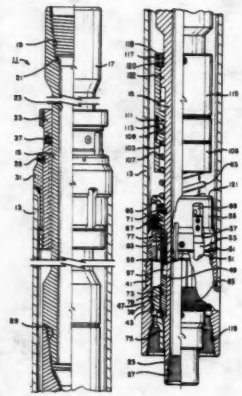
SETTING TOOL WITH RETRACTABLE TORQUE FINGERS

David L. Nevels, Woodlands, and John L. Baugh, Huntsville, both of Tex., assignors to Hughes Tool Company, Houston, Tex.

Continuation-in-part of Ser. No. 633,818, Jul. 24, 1984, abandoned. This application Jul. 31, 1985, Ser. No. 761,224

Int. Cl.[4] **E21B** *23/02*

U.S. Cl. 166—382 **9 Claims**



8. A method of setting a liner in a well bore using a setting tool of the type adapted to be made up in a pipe string for releasably engaging a setting sleeve in a well bore, comprising the steps of:

connecting a mandrel in the pipe string which has a setting nut with external connecting threads for engaging mating connecting threads located on the interior of a setting sleeve disposed about said mandrel, the mandrel being slidably disposed within said setting nut when said setting nut is engaging said setting sleeve, said mandrel being slidable between an extended, running-in position and a weight set-down position;

mounting a torque collar on said mandrel exterior, said torque collar having at least one torque finger mounted thereon which is axially slidable on an external surface of said torque collar in a plane which is parallel to the longitudinal axis of the tool, said setting sleeve having at least one end notch adapted to receive said axially slidable torque finger;

initially latching the mandrel to the setting sleeve with each torque finger received within its respective end notch;

setting weight down on the pipe string from the well surface to release the latch and allow relative movement between the connecting threads of the setting nut and setting sleeve;

applying right hand torque to the pipe string to release the connecting threads of the setting nut from the setting sleeve;

temporarily lifting the pipe string and setting tool to test the disengagement of the setting nut;

again resting the setting tool on the setting sleeve;

rotating said pipe string to realign said torque finger and said setting sleeve end notch and reengage said torque finger with said end notch; and

continuing to rotate to the right to rotate the setting sleeve during subsequent well bore operations.

4,598,775

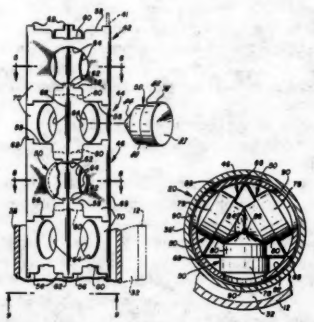
PERFORATING GUN CHARGE CARRIER IMPROVEMENTS

Roy R. Vann, and Edward A. Colle, Jr., both of Houston, Tex., assignors to Geo. Vann, Inc., Houston, Tex.

Continuation of Ser. No. 385,463, Jun. 7, 1982, abandoned. This application Jul. 19, 1985, Ser. No. 756,531

Int. Cl.[4] **E21B** *43/117*

U.S. Cl. 175—4.6 **13 Claims**



1. In a perforating gun for perforating a casing located downhole in a cased borehole, said gun having a housing, shaped charges in said housing spaced from one another and connected to a detonation means, each shaped charge having a flange means on one end of a body portion, the other end of the body portion being the detonator end, the combination with said housing, charges, and detonation means of a charge carrier assembly;

said charge carrier assembly comprises a plurality of charge holders connected together along the longitudinal axis of the gun; each charge holder describes a polyhedron, each polyhedron being described by relatively thin wall surfaces joined together by lateral edges which extend paral-

lel to the axial centerline of said gun and provide opposed fasteners for the shaped charge;

each said charge holder has a plurality of lateral faces, one said face is apertured to telescopingly receive a shaped charge therewithin, adjacent charge holders have means for orienting the shaped charges of alternate charge holders in different radial directions; and

means for capturing a shaped charge within an aperture of a charge holder

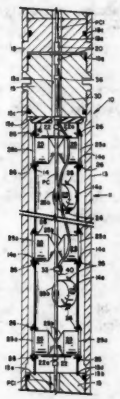
whereby the body portion of each said shaped charge is received within said aperture of said charge holder with the flange means of said shaped charge abutting a lateral of said charge holder, and having the opposed fasteners extending towards an opposed fastener located on an alternate charge holder to capture the flange between two opposed fasteners and the lateral face of the charge holder so that the inner detonator end of the charge is positioned near the geometrical center of the charge holder.

4,598,776

METHOD AND APPARATUS FOR FIRING MULTISECTION PERFORATING GUNS

Gregg W. Stout, Montgomery, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Jun. 11, 1985, Ser. No. 743,579
Int. Cl.[4] E21B *43/116*
U.S. Cl. 175—4.54 **14 Claims**



1. The method of producing the detonation of shaped charges disposed in a plurality of vertically stacked, perforating gun sections for a subterranean well, comprising the steps of:

(1) running a primer cord through each gun section adjacent the ignition end of each shaped charge container in the section;

(2) securing a booster charge to the top and bottom ends of each primer cord to transmit a detonating force from the bottom of one gun section to the top of the next gun section;

(3) positioning a low-deflagration rate detonation-transmitting element in each gun section in parallel relationship to at least a portion of said primer cord with the upper end thereof disposed in proximity to said booster charge of an upwardly adjacent gun section; and

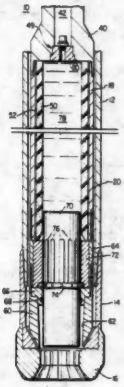
(4) connecting the lower end of said detonation-transmitting element to a charge disposed adjacent said primer cord of the lower adjacent gun section, thereby assuring transfer of detonating energy from each gun section to the next adjacent gun section.

4,598,777

METHOD AND APPARATUS FOR PREVENTING CONTAMINATION OF A CORING SPONGE

Arthur Park, Odessa, and Bob T. Wilson, Midland, both of Tex., assignors to Diamond Oil Well Drilling Company, Midland, Tex.

Continuation-in-part of Ser. No. 513,267, Jul. 13, 1983, Pat. No. 4,479,557. This application Oct. 17, 1984, Ser. No. 661,893
Int. Cl.[4] E21B *25/08*
U.S. Cl. 175—58 **14 Claims**



1. A well core drilling apparatus for recovery of subterranean fluid, comprising:

means for boring a well core containing subterranean fluid;

container means associated with said boring, means for receiving said well core at one end and containing said well core;

said container means sealed at the opposite end from said receiving end;

an absorbent member disposed on the inner walls of said container means and positioned adjacent said well core, said absorbent member for absorbing subterranean fluid that bleeds from said well core;

a reciprocating piston disposed in the receiving end of said container means for being reciprocated from the receiving end of said container means to the opposite end of said container means by said core when said core enters said container means;

means for sealing the space between said piston and the inner walls of said container means when said piston is disposed at the receiving end thereof, reciprocation of said piston from the receiving end of said container means and upward therein breaking the seal; and

a fluid disposed in said container for preventing contaminants external to said container means from entering said container means and contaminating said absorbent member;

said fluid being pressurized to exert a force on said piston outward from said container means to maintain the seal provided by said sealing means;

reciprocation of said piston upwards within said container means causing fluid to exit from said container means to wash contaminants from said well core.

14. A method for drilling a well core and recovering subterranean fluids disposed therein, comprising:

drilling the well core;

providing an inner barrel for containing the well core, the inner barrel having a receiving end for receiving the well core as it is formed;

disposing absorbent material in the inner barrel for absorbing the subterranean fluid that is contained in the well core for later retrieval and analysis;

sealing the end of the inner barrel opposite the receiving end thereof;

disposing a reciprocating piston in the receiving end of the inner barrel, the piston contacting the well core and reciprocating within the inner barrel from the receiving end to the opposite end thereof as the well core moves upward into the inner barrel;

sealing the space between the reciprocating piston and the inner walls of the inner barrel at the receiving end thereof such that the receiving end of the inner barrel is sealed to provide a completely sealed inner barrel;

disposing a pressurized fluid within the inner barrel to maintain the seal at the receiving end of the inner barrel; and

breaking the seal at the receiving end of the inner barrel when the well core contacts the piston and reciprocates it within the inner barrel from the receiving end thereof to cause the fluid to flow outward through the receiving end of the inner barrel to wash the core entering the inner barrel.

4,598,778

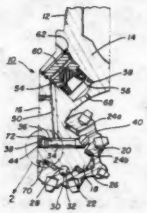
ROTARY ROCK BIT BALL PLUG

Albert E. Highsmith, Grand Prairie, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 13, 1985, Ser. No. 733,177

Int. Cl.[4] E21B *10/24*

U.S. Cl. 175—371 **6 Claims**



4. A rock bit having a cutter retained on an axle through an array of rolling members interposed within an interior annular space therebetween and a passage, defining a passage wall for inserting said rolling members from the exterior of said bit to said interior space, a plug for closing said passage and retaining said members in said space, said plug welded adjacent the bit exterior for securing the plug, and a resiiient metal ring means interposed between the plug and the passage wall for resiliently engaging said wall and preventing weld slag or weld material from entering said passage interiorly of said preventing means.

4,598,779

ROCK DRILL BIT

Bernt S. Liljekvist, Storvik; Bo Carl G. Nordmark, and Tommy S. Tukala, both of Sandviken, all of Sweden, assignors to Santrade Limited, Lucerne, Switzerland

Filed Sep. 14, 1984, Ser. No. 650,663

Claims priority, application Sweden, Sep. 20, 1983, 8305048

Int. Cl.[4] E21C *13/06*

U.S. Cl. 175—410 **18 Claims**

1. A rock drill bit of the impact type, comprising:

a shaft,

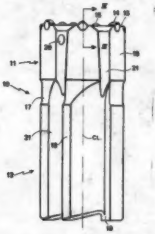
a boring head situated at a forward end of said shaft and defining a first longitudinal axis, said boring head comprising

a generally forwardly facing front end including a front surface,

a jacket surface extending generally longitudinally and defining the outer periphery of said boring head, and

a plurality of holes formed in said front end, said holes each defining a second longitudinal axis diverging forwardly relative to said first longitudinal axis and forming an acute angle therewith, each said second axis intersecting the planes of said front end and said jacket surface, the intersection with said plane of said jacket surface occurring forwardly of a rear end of said hole,

a plurality of cutting inserts disposed in respective ones of said holes, each insert comprising a generally cylindrical mounting portion frictionally mounted in said holes, and an outer portion extending out of said hole and including



a chisel-shaped cutting edge located at a distance forwardly from a forwardmost point of said front surface and oriented generally radially with reference to said first longitudinal axis, and

a guiding surface extending between said mounting portion and said cutting edge,

said guiding surface being mainly flush with said jacket surface and having a curvature of generally the same radius as said jacket surface, said guiding surface extending forwardly and rearwardly of said front surface.

4,598,780

ELECTRONIC SCALE PRINTER

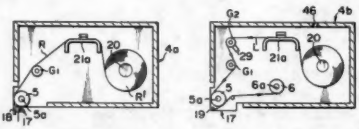
Yoshitaka Iwasaki; Kunio Mori, and Yoshio Tanabe, all of Tokyo, Japan, assignors to Teraoka Seiko Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1985, Ser. No. 705,533

Claims priority, application Japan, Mar. 2, 1984, 59-39844; Mar. 2, 1984, 59-39845; Mar. 8, 1984, 59-44876; Mar. 8, 1984, 59-33898[U]; Dec. 28, 1984, 59-278899

Int. Cl.[4] G01G *23/38*; G01D *9/00*

U.S. Cl. 177—3 **32 Claims**



1. An electronic scale printer having a main body electrically connected to an electronic scale, desired data being printed on a printing sheet which is issued said printer, comprising:

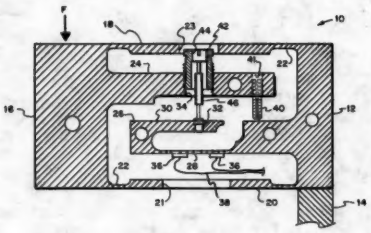
(a) a receipt cassette for storing a receipt printing sheet;
(b) a label cassette for storing a label printing sheet;
(c) cassette installing means arranged at the main body of the printer for removably attaching either the receipt cassette or the label cassette to the printer;
(d) means for discriminating whether the printing sheet stored in the cassette installed in the installing means is the receipt sheet or the label sheet;
(e) printing control means comprising receipt printing control means and label printing control means for controlling selection of either the receipt printing control means or the label printing control means; and
(f) printing means for printing the receipt sheet or the label sheet.

4,598,781

LOAD CELL HAVING A FLEXURE CONNECTOR

Herbert Tramposch, Riverside, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed May 25, 1984, Ser. No. 614,074
Int. Cl.⁴ G01G *3/08, 3/14*
U.S. Cl. 177—211 **17 Claims**



1. In a load cell having a fixed support member, a movable support member, and a pair of links connecting the fixed support member and the movable support member to form a parallelogram, a first beam extending from the fixed support member, a second beam extending from the movable support member and a longitudinally connecting member between the first beam and second second, the connecting member comprising:

a cylindrical member having a central portion and end portions on opposite longitudinal ends of the central portion, the end portions of the cylindrical member having reduced diameters, means for engaging one end of one of said cylindrical member with one of said beams, the end of the other of said cylindrical member extending through the other of said beams and means for connecting said other end to said other beam.

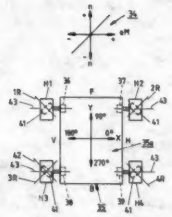
4,598,782

DEVICE FOR EXPLOITING THE MAXIMUM DRIVE UNIT TORQUE OF THE DRIVES OF VEHICLES OR CONVEYERS

Bengt E. Ilon, Meggen, Sweden, assignor to Mecanum Innovation AB, Umea, Sweden

Filed Aug. 10, 1984, Ser. No. 639,349
Claims priority, application Sweden, Aug. 16, 1983, 8304423
Int. Cl.⁴ B62D *57/00*
U.S. Cl. 180—7.1 **4 Claims**

1. Steering device for controlling the traveling direction and speed of vehicles, which vehicles are movable in optimal directions including directions along a straight path deviating from main traveling direction of straight forward, straight backward, straight to the right and straight to the left and have at least two driven means with oblique ground contact elements, the steering device comprising means for generatiang control signals which control the direction of rotation ans speed of drive units for individual driving of the driven means of the vehicle, whereby said steering device controls the traveling direction and speed of the vehicle, said means for generating control signals further including means to generate control signals of a limited magnitude for controlling the speed of the drive units when the steering device generates control signals for driving the vehicle in directions along a straight path deviating from the main traveling directions of the vehicle to limit the magnitude of the control signals for controlling the speed of the drive units relative to the magnitude of the control signals for controlling the speed of the drive units when the steering device generates control signals for driving the vehicle in the main traveling directions.

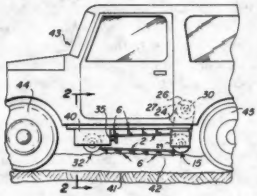


4,598,783

TRACTION DEVICE FOR VEHICLES

Lesley T. Tippen, 118 Roxanna St., West Monroe, La. 71291, assignor to Lesley Jerry Tippen; Bettie Tippen Young, both of West Monroe; Sharon Tippen Schooley, Calhoun and Lisa Tippen Carter, West Monroe, all of, La., part interest to each

Filed Sep. 24, 1984, Ser. No. 653,456
Int. Cl.⁴ B62D *55/02*
U.S. Cl. 180—9.32 **4 Claims**



1. An auxiliary traction device for a wheeled vehicle, comprising

(a) a pair of parallel, spaced auxiliary axles rotatably connected with the vehicle and arranged between and parallel with the axles of the vehicle;
(b) a plurality of spaced sprockets connected for rotation with each of said auxiliary axles;
(c) a plurality of endless chains connected with corresponding pairs of sprockets between said pair of auxiliary axles, the plane containing the lower portion of said endless chains being vertically spaced above the plane containing the lowermost portion of the vehicle wheels;
(d) a plurality of ground-engaging means extending transversely across and removably connected with said endless chains;
(e) drive means connected with one of said auxiliary axles for rotating said axle to drive said chains, said drive means including
(1) an auxiliary motor; and

(2) drive chain means connected between said auxiliary motor and said one axle; and

(f) adjustable bearing means connecting the other of said axles with said vehicle, said adjustable bearing means being operable to vary the spacing between said pair of auxiliary axles in order to control the tension of said plurality of endless chains, whereby when the wheels of the vehicle enter a rut and said ground engaging means engage the ground adjacent the rut, said auxiliary motor is actuated to drive said one axle, thereby driving said endless chains with said ground engaging means providing additional traction to the vehicle to propel it from the rut relative to the ground.

4,598,784

SHAFT-STEERED CONVEYOR APPLIANCE

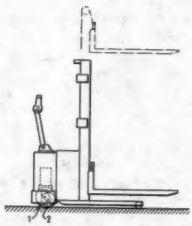
Günter Tronich, Landshut, and Martin Schmid, Niederhornbach, both of Fed. Rep. of Germany, assignors to Steinbock GmbH, Moosburg, Fed. Rep. of Germany

Filed Jan. 16, 1985, Ser. No. 692,362

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1984, 3402495

Int. Cl.⁴ B62D *51/04*

U.S. Cl. 180—19.2 **13 Claims**



1. Shaft-steered conveyor appliance, in the form of a pedestrian-controlled lift tank or stacker, in which a hub-motor-driven drive wheel steerable by a shaft is arranged between two lateral support wheels, the drive wheel is pressed into ground engagement by spring means and the initial stress of the spring means is variable by an initial-stressing device in dependence upon an operational parameter, said initial-stressing device includes said spring means (7), adjusting means (6) for the initial stressing of the spring means (7), control means (10, 11, 12) for said adjusting means (6) and braking means in operative connection with said control means (10, 11, 12), said adjusting means (6) being variable in dependence upon the application of the braking action.

4,598,785

VEHICLE

James C. LeBlanc, 38261 Long St., Mt. Clemens, Mich. 48045

Continuation of Ser. No. 504,944, Jun. 16, 1983, abandoned, which is a continuation of Ser. No. 287,042, Jul. 27, 1981, abandoned, which is a continuation of Ser. No. 145,604, May 1, 1980, abandoned, which is a division of Ser. No. 927,600, Jul. 21, 1979, abandoned. This application Apr. 5, 1985, Ser. No. 719,649

The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.

Int. Cl.⁴ B60L *11/00*

U.S. Cl. 180—68.1 **11 Claims**

1. In an armored vehicle having a body of monocoque construction and an engine positioned in said body, a cooling system comprising:

a plenum chamber disposed in said body between a sidewall of said body and said engine,

said engine being disposed outside of said plenum chamber,

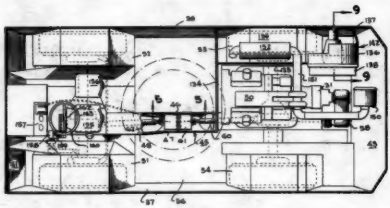
a plenum exhaust means associated with said plenum chamber for exhausting gases from a forward portion of said plenum chamber to the exterior of said body,

a fan mounted in a rear portion of said plenum chamber,

a radiator disposed in the interior of said body substantially in a rear corner thereof and operatively connected to said engine,

a securing means for securing said radiator and said fan in said body immediately adjacent to each other and in parallel vertical planes disposed generally parallel to the center longitudinal axis of said body,

said body including an air inlet opening disposed generally above said engine,



a driving means operatively connected to said fan for driving said fan, and said fan being positioned, so that it draws air through said air inlet, then rearwardly through the interior of said body, rearwardly over said engine, laterally through said radiator and generally forward through said plenum chamber and out through said plenum exhaust means,

an operator's station positioned in a forward location in said body forward of said engine, and

said driving means driving said fan so that it draws air rearward away from said operator's station.

4,598,786

MOTOR VEHICLE WITH A SOUND-ABSORBING CAPSULE FOR THE DRIVING ENGINE

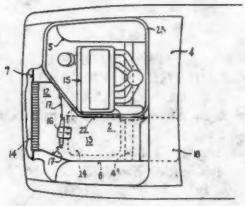
Karl Kirchweger, Graz, Austria, assignor to A V L Gesellschaft für Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof. Dr. Dr. h.c. Hans List, Graz, Austria

Continuation-in-part of Ser. No. 506,799, Jun. 22, 1983, abandoned. This application Aug. 12, 1985, Ser. No. 764,964

Claims priority, application Austria, Jul. 1, 1982, 2557/82; Aug. 19, 1982, 3159/82

Int. Cl.⁴ B60K *11/00*

U.S. Cl. 180—68.1 **10 Claims**



1. A motor vehicle, comprising a water-cooled internal combustion driving engine transversely mounted and having a flange-mounted gearbox, a radiator and an associated fan, walls defining a completely enclosed, sound-absorbing capsule containing said engine and said gearbox, said walls being at least partly formed by surrounding parts of the vehicle and a top comprising an engine hood of the vehicle, and one of said walls comprising a separate bottom plate at the lower side of said

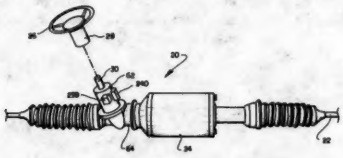
capsule, a separate housing located within said capsule for receiving cooling air flowing off from said radiator, said housing being closed relative to the interior of said capsule and comprising part of a front wall of said capsule, an air duct located within said capsule and being closed relative to the interior of said capsule, said air duct being partly formed by at least one section of the walls of said surrounding capsule and being in open communication with said housing for carrying the outflow of cooling air and leading from said housing to the outside of said capsule through another of said walls thereof, and said air duct extending through said capsule, adjacent a cylinder block of said engine and lying above said gearbox.

4,598,787

CONTROL APPARATUS FOR POWER ASSIST STEERING SYSTEM

Gilbert H. Drutchas, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Nov. 30, 1984, Ser. No. 676,522
Int. Cl.⁴ B62D *5/04*
U.S. Cl. 180—79.1 **47 Claims**



1. An apparatus for controlling an electric assist steering system having an electric motor drivably connected to a steering member to assist in driving said steering member, said apparatus comprising:

torsion sensing means for providing an output signal that varies in accordance with the amount of force applied to a vehicle hand wheel to accomplish a steering maneuver, said variance occuring after a predetermined amount of force is applied to the vehicle hand wheel;

means responsive to said output signal from said torsion sensing means for generating a variable amount of electrical drive potential to drive said electric motor, the speed of the electric motor varying in accordance with the output signal of said torsion sensing means; and

switch means connected to said electric motor and to said generating means and mechanically actuatable in response to a predetermined amount of force applied for connecting said variable amount of electrical drive potential to said electric motor when in an actuated condition.

4,598,788

STEERING SYSTEM FOR VEHICLES

Mitsuya Serizawa, Tochigi; Shoichi Sano, Tokyo, and Yoshimi Furukawa, Tochigi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

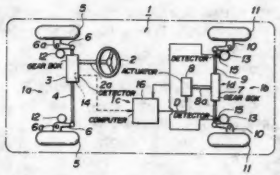
Filed Jan. 29, 1985, Ser. No. 695,956
Claims priority, application Japan, Feb. 2, 1984, 59-18135; Feb. 2, 1984, 59-18136
Int. Cl.⁴ B62D *5/00*
U.S. Cl. 180—140 **10 Claims**

1. A steering system for a vehicle having a vehicle body with a front wheel and a rear wheel, and a wheel suspending mechanism for suspending said front wheel and said rear wheel from said vehicle body, respectively, comprising:

a front wheel steering mechanism for steering said front wheel at an angle in accordance with a steering operation of a driver of said vehicle;

a rear wheel steering mechanism for steering said rear wheel at an angle in accordance with a travelling state of said vehicle; and

said rear wheel steering mechanism including first means for determining a steered angle correction quantity of said rear wheel in correspondence with a cushioning state of



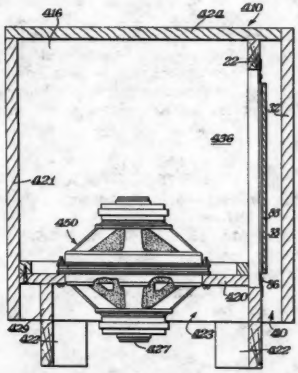
said wheel suspending mechanism, and second means for specifying said steering angle of said rear wheel in accordance with said steered angle correction quantity.

4,598,789

SOUND REPRODUCING

David W. Ritter, Holmes, Pa., assignor to Temporal Dynamics Research, Inc., Aston, Pa.

Continuation-in-part of Ser. No. 369,825, Apr. 19, 1982, Pat. No. 4,466,505. This application Mar. 2, 1984, Ser. No. 585,386
The portion of the term of this patent subsequent to Aug. 21, 2001, has been disclaimed.
Int. Cl.⁴ H05K *5/00*
U.S. Cl. 181—144 **2 Claims**



1. A loudspeaker combination having an essentially rigid generally rectangular box, the height, width and depth of which are each between about 15 and about 21 inches, the bottom of the box being essentially open and fitted with spaced feet on which the box can stand on a pile rug without materially blocking the emergence of sound generated within the box, the top and all sides of the box being essentially imperforate essentially rigid walls which essentially do not transmit sound, a woofer sound generator mounted within the box, and also inside the box a generally vertically extending partition that forms a generally vertically extending open-bottomed compartment about 1 to 2 inches thick, connected as a duct to conduct and discharge the lowest frequency sounds generated by the woofer.

4,598,790

HEAT AND SOUND INSULATION DEVICE

Naomoto Uesugi, Tokyo, and Shoji Suzuki, Aichi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

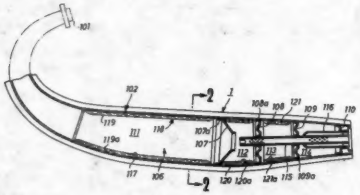
PCT No. PCT/JP84/00013, § 371 Date Nov. 8, 1984, § 102(e) Date Nov. 8, 1984, PCT Pub. No. WO84/02954, PCT Pub. Date Aug. 2, 1984

PCT Filed Jan. 20, 1984, Ser. No. 650,634

Claims priority, application Japan, Jan. 20, 1983, 58-6588; Feb. 22, 1983, 58-24929[U]; Feb. 25, 1983, 58-30502; Feb. 28, 1983, 58-28876[U]; Feb. 28, 1983, 58-28866[U]

Int. Cl.[4] F01N *1/10*

U.S. Cl. 181—252 10 Claims



1. A heat and sound insulation device adapted for use as a muffler through which may be flowed exhaust gases from an internal combustion engine, which comprises:

(a) an exhaust passage having peripheral walls, an inlet thereto and an outlet therefrom;

(b) a plurality of partitions in said passage to provide a plurality of compartments therealong;

(c) means for flowing exhaust gases through said compartments and out of said outlet; and

(d) said peripheral walls being lined with heat and sound insulation material made by mixing enlongate glass fibers with ceramic fibers composed of 45% kaolin and 52% silicic acid to form a mass in which the ratio of ceramic fibers to glass fibers is in the range of 35 to 70 weight percent, impregnating said mass with an inorganic binder of water glass and thereafter pressing said mass in a die to a density of at least 200 Kg/m^3 to a predetermined shape.

4,598,791

EXHAUST SILENCER

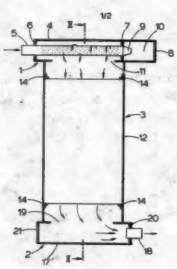
Stanley Bates, Broseley, England, assignor to Chillcotts Limited, Madeley, England

Filed Mar. 13, 1984, Ser. No. 588,965

Claims priority, application United Kingdom, Mar. 17, 1983, 8307371

Int. Cl.[4] F01N *1/08*

U.S. Cl. 181—264 10 Claims



1. An exhaust silencer comprising an enclosure defining a chamber of rectangular cross section, one transverse dimension of which is greater than the other, an inlet pipe disposed within the chamber at one end transversely of the transverse dimension of greater length, one end of which enters the chamber at one side and the other end of which extends from the chamber at the other side, a nozzle at said other end exteriorly of the chamber, said inlet pipe containing within the chamber a plurality of perforations providing communication between the inlet pipe and the interior of the chamber, an outlet at the other end of the chamber and noise attenuating means disposed in the chamber between the inlet pipe and the outlet comprising a plurality of spaced, parallel, imperforate flat plates made of heat and corrosion-resistant material, said plates corresponding in width to the longer transverse dimension of the chamber and of a length corresponding to substantially the length of the chamber between the inlet pipe at the one end and the outlet at the other end.

4,598,792

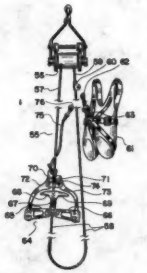
SKY-RIDE VERTICAL MOBILITY SYSTEM

Hyok S. Lew; Hyon S. Lew, and Yon K. Lew, all of 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 676,400, Nov. 30, 1984, Pat. No. 4,598,793. This application Dec. 17, 1984, Ser. No. 682,673

Int. Cl.[4] A62B *1/08*

U.S. Cl. 182—42 8 Claims



1. A device for lowering a person or object from a higher elevation to a lower elevation comprising in combination:

(a) a cylindrical member secured to a supporting structure including a means for securing said supporting structure to an elevated structure, wherein said cylindrical member is rotatable in one direction and nonrotatable in the other direction opposite to said one direction;

(b) a squeezable brake lining of a substantial wall thickness enveloping the cylindrical surface of said cylindrical member in a rotatable relationship;

(c) a cord member wound on said squeezable brake lining over at least one and one half complete laps wherein one portion of said cord member extends from one side of the cylindrical surface of said squeezable brake lining and the other portion of said cord member extends from the other side of the cylindrical surface of said squeezable brake lining enveloping said cylindrical member;

(d) a cord guide means for guiding said cord member wound on said squeezable brake lining, wherein said cord guide means enhances smooth looping movement of said cord member wound on said squeezable brake lining creating rotation of said squeezable brake lining; and

(e) at least one securing means affixed to said one portion of said cord member for securing a harness, wherein pull of said one portion of said cord member rotates said squeezable brake lining relative to said cylindrical member in said the other direction experiencing a braking and pull of said the other portion of said cord member rotates said squeezable brake lining and said cylindrical member together in said one direction without experiencing braking;

whereby, a person or persons wearing a harness secured to said securing means affixed to said one portion of said cord member can remain suspended in midair or lower oneself at a safe speed by exerting a small amount of pull on said the other portion of said cord member as said small amount of pull on said the other portion of said cord member produces a tension on said cord member that squeezes said squeezable brake lining on said cylindrical member, providing a frictional braking hindering rotating movements of said squeezable brake lining relative to said cylindrical member in said the other direction and, thus, providing braking on looping movement of said cord member resulting from said rotating movement of said squeezable brake lining in said the other direction, while said cord member can be looped in said one direction substantially freely after said a person or persons is detached from said one portion of said cord member.

4,598,793

SKY-RIDE EMERGENCY ESCAPE SYSTEM

Hyok S. Lew; Hyon S. Lew, and Yon K. Lew, all of 7890 Oak St., Arvada, Colo. 80005

Filed Nov. 29, 1984, Ser. No. 676,400
Int. Cl.[4] A62B *1/08*
U.S. Cl. 182—42 **12 Claims**

1. A device for lowring a person or object from a higher elevation to a lower elevation, said device comprising in combination:

(a) a cylindrical member nonrotatably secured to a supporting structure including a means for securing said supporting structure to an elevated structure;

(b) a squeezable brake lining of a substantial wall thickness enveloping the cylindrical surface of said cylindrical member in a rotatable relationship;

(c) a cord member wound on said squeezable brake lining over at least one and one half complete laps wherein one portion of said cord member extends from one side of the cylindrical surface of said squeezable brake lining and the other portion of said cord member extends from the other side of the cylindrical surface of said squeezable brake lining enveloping said cylindrical member;

(d) a cord guide means for guiding said cord member wound on said squeezable brake lining, wherein said cord guide means enhances smooth looping movement of said cord member wound on said squeezable brake lining creating rotation of said squeezable brake lining; and

(e) at least one securing means affixed to said one portion of said cord member for securing a harness;

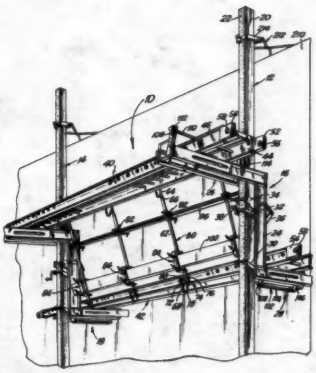
whereby, a person or persons wearing a harness secured to said securing means affixed to said one portion of said cord member can remain suspended in midair or lower oneself at a safe speed by exerting a small amount of pull on said the other portion of said cord member as said small amount of pull on said the other portion of said cord member produces a tension on said cord member that sequeezes said squeezable brake lining on said cylindrical member, providing a frictional braking hindering rotating movements of said squeezable brake lining relative to said cylindrical member and, thus, providing braking on looping movement of said cord member resulting from said rotating movements of said squeezable brake lining relative to said cylindrical member.

4,598,794

SCAFFOLDING SYSTEM

Carl E. Anderson, 12 St. Stephens Pl., Staten Island, N.Y. 10306

Filed Mar. 22, 1985, Ser. No. 714,931
Int. Cl.[4] E04G *1/20*
U.S. Cl. 182—113 **15 Claims**



1. A side rail system for interconnecting layered sections of elongated scaffold staging which sections respectively span pairs of upper and lower support arms of pump jacks respectively riding on spaced apart pump jack poles, each section of scaffold staging including longitudinally spaced transverse hollow rungs, said side rail system comprising upright posts for positioning along the staging, a pair of rods associated with each post, said rods being slidably received within the hollow rungs so as to be confrontingly projecting from the respective upper and lower staging sections, said rods havng stop means at one end thereof for preventing complete passage through the hollow rungs, coupling means for pivotally connecting each post to the projecting ends of the associated rods to permit angled positioning between the post and the rod, removable guard means for preventing separation of the coupled posts and rods, and rail means longitudinally extending between said plurality of posts.

4,598,795

LADDER HOIST ATTACHMENT

Kevin Larson, 6760 W. 32nd Ave., Wheat Ridge, Colo. 80033

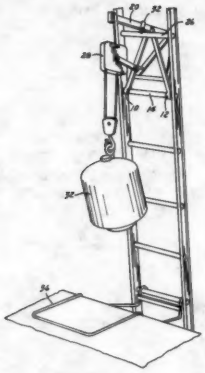
Filed Jun. 21, 1985, Ser. No. 747,561
Int. Cl.[4] E06C *7/12, 7/00*
U.S. Cl. 182—129 **4 Claims**

1. A ladder hoist attachment comprising:

(a) A prop having a number of feet for removably securing the prop to a rung of the ladder; a number of elongated members extending horizontally from said feet, each of said members having a vertical step at a predetermined length from said feet;

(b) A boom assembly comprising a number of feet that re-

movably attach to a rung of the ladder; a boom extending horizontally over the top rung of the ladder; and a number



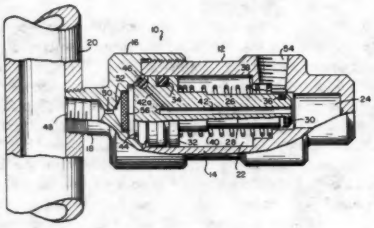
of braces connecting the feet and boom, the foward most brace resting against the top rung of the ladder.

4,598,796

LUBRICATOR

Robert E. Barrows, Fincastle, Va., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Feb. 22, 1985, Ser. No. 704,504
Int. Cl.[4] F16N *1/10, 13/06*
U.S. Cl. 184—42 **4 Claims**



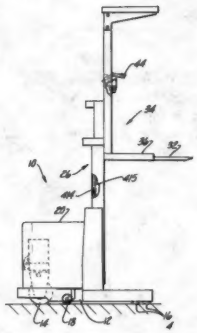
1. An air line lubricator comprising:
a hollow housing defining a chamber having two different cross sectioned areas;
a stepped piston sealingly movable in said chamber to form two variable volume lubricant-receiving reservoirs in conjunction with said chamber;
a first of said variable volume reservoirs formed by the smaller cross section area of said piston in said smaller cross section area of said chamber and in communication with a lubricant supply;
a second of said variable volume reservoirs formed by the greater cross section area of said piston in said greater cross section area of said chamber and located adjacent and in communication with an air line;
means for drawing lubricant from said lubricant supply to said first variable volume reservoir and for expelling lubricant from said second variable volume reservoir when said piston moves in a direction to reduce the volume of said second variable volume reservoir;
a conduit in said piston for conducting lubricant from said first variable volume reservoir to said second variable volume reservoir when said piston moves in a direction to reduce the volume of said first variable volume reservoir; and
means for sealing said conduit to prevent lubricant leakage from said first variable volume reservoir when the volume of said second variable volume reservoir is at a minimum.

4,598,797

TRAVEL/LIFT INHIBIT CONTROL

Donald L. Schultz, Richland, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Apr. 13, 1984, Ser. No. 599,938
Int. Cl.[4] B66B *9/20*
U.S. Cl. 187—9 E **10 Claims**



1. In a lift truck of the type comprising an electric traction motor, manually controlled speed signal generating means for generating a speed command signal voltage varying inversely with a desired speed, an extendible upright, and control means for said motor responsive to a speed control voltage for controlling the speed of said motor, the improvement comprising:
height signal generating means operatively coupled with said upright for generating a height signal voltage varying directly with the amount of extension of said upright,
logic means responsive to said speed command signal voltage and to said height signal voltage for producing the speed control voltage corresponding to the value of the larger of said signal voltages,
and means for applying said speed control voltage to said control means whereby the speed of said motor is governed by only one of said signal voltages.

4,598,798

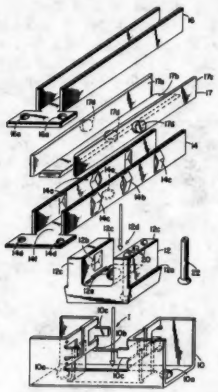
SLIDING SHOE SYSTEM

Werner Koppensteiner, Vienna, Austria, assignor to Otis Elevator Company, Farmington, Conn.

Filed Jun. 29, 1984, Ser. No. 626,566
Claims priority, application Austria, Jan. 31, 1984, 309/84
Int. Cl.[4] B66B *7/02*
U.S. Cl. 187—95 **1 Claim**

1. An elevator guide, comprising:
a guide shoe;
a guide bracket for attaching the guide to an elevator car;
a shoe retainer;
an elastomeric pad;
the retainer being mounted on the pad, the pad being mounted on the bracket;
characterized by:
the rigidity of the pad being mechanically adjustable in discrete steps by adding rigid material to the pad;
the pad containing at least one hole for receiving a rigid pin;
a second bracket;

a second one of said pads mounted in the bracket; the retainer being mounted in each pad; and



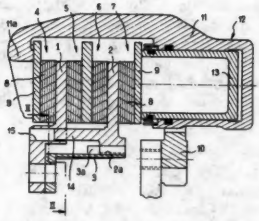
the retainer containing longitudinal allignment and locking elements for attaching the retainer to at least two of said pads substantially side-by-side.

4,598,799

MULTI-DISC BRAKE

Alain Thioux, Chennevieres, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Nov. 27, 1984, Ser. No. 675,166
Claims priority, application France, Nov. 30, 1983, 83 19139
Int. Cl.⁴ F16D *55/36*
U.S. Cl. 188—71.5 **3 Claims**



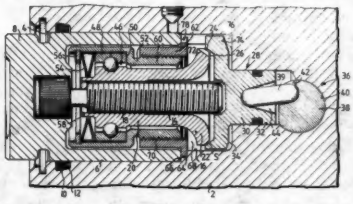
1. A multi-disc brake for a vehicle, comprising a first rotary disc firmly fixed at a radially inner portion to a wheel of the vehicle and a second rotary disc mounted radially inwardly so as to be capable of sliding in an axial direction on a radially inner support component which is also fixed firmly to the wheel, said second rotary disc and the radially inner support component including complementary-shaped splines having a gear tooth profile and meshed together to provide rotation of the second rotary disc by the support component while allowing axial displacement of the second rotary disc, a set of friction pads carrying friction linings for application against surfaces of the discs by a hydraulic cylinder disposed in a caliper, the caliper extending radially outwardly and over the discs and friction linings and the friction linings extending only over a limited annular sector of peripheral areas of the discs, axial projections circumferentially spaced-apart and extending from the second rotary disc, the projections extending into and engaging complementary-shaped openings in the first rotary disc, the projections located at a radially inner portion of the second rotary disc and adjacent the splines which cause the second rotary disc to rotate with the radially inner support component, the projections and openings having lunule-shaped cross-sections and the projections integral with the second rotary disc, the projections having only radially outer surfaces engaging corresponding wall surfaces of the respective openings, each projection having radial and circumferential clearances with the respective opening, and a device for generating torque disposed between a lateral flank of at least one of the projections and an opposite wall of the corresponding opening, the device urging circumferentially the projections and openings against one another in engagement and in a circumferential direction corresponding to transmission of braking torque.

4,598,800

AUTOMATIC ADJUSTING DEVICE FOR A DISC BRAKE

Vlad Marianu, Kelkheim-Fischbach, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Oct. 1, 1984, Ser. No. 656,778
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1983, 3336119
Int. Cl.⁴ F16D *55/26, 65/38*
U.S. Cl. 188—71.9 **14 Claims**



1. An automatic adjusting device for a disc brake of the type including a brake piston slidably mounted in a brake cylinder in a housing adapted to actuate a brake shoe in which said brake piston is actuatable by a hydraulic and a mechanical actuating device comprising:

an adjusting nut having a coaxial threaded bore, said adjusting nut mounted to said brake piston for coaxial extension relative to said brake piston by a threaded member fixedly secured at one end to said brake piston and including a thread received in said threaded bore, said thread being of a steep, non-self locking type, said adjusting nut further including a first friction surface at one end;

a hand brake piston slidably mounted in said housing coaxial with said adjusting nut, said hand brake piston operatively connected to said mechanical actuating device and including a second friction surface adjacent to and spaced from said first friction surface in an unactuated mode of said mechanical actuating device, said first and second friction surfaces defining a friction clutch for engaging and frictionally restraining said adjusting nut against torsional movement when said mechanical actuating device is actuated;

a sleeve fixedly mounted to said housing and disposed around said adjusting nut between said adjusting nut and said brake piston;

one antifriction bearing mounted between said sleeve and said adjusting nut;

a spring within said sleeve supported on one side by a first stop on said sleeve biasing said bearing onto said adjusting nut against a second stop on said sleeve; and

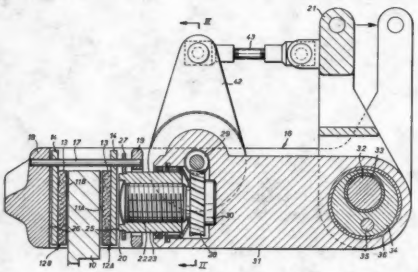
means for adjusting the spacing between said first and second friction surfaces.

4,598,801

CLAMPING DEVICE

Gino Villata, Buttigliera D'Asti, Italy, assignor to Valeo, Paris, France

Filed Jun. 26, 1984, Ser. No. 624,906
Claims priority, application France, Jun. 30, 1983, 83 10882
Int. Cl.[4] F16D 65/56
U.S. Cl. 188—71.9 8 Claims



1. Clamping device, such as a brake, comprising: a body which is to be clamped, such as a rotating disc; friction means operable to apply a clamping force to the body; a clamping element movable between a return release position and an advansed clamping position in which it urges the friction means into clamping engagement with the body; control means for controlling the clamping device and a support carrying the clamping element and displaceable during the forward movement of the clamping element and during the return movement under the action of control means; the support comprising a part extendable in response to angular displacement of a ratchet wheel, the ratchet wheel being cooperable with a pawl attached to the control means; a transmission member operably disposed between the ratchet wheel and the extendable part, a first friction element (A) operatively interposed between the ratchet wheel and the transmission member, a second friction element (B) operatively interposed between the pawl and the transmission member, and a third friction element (C) operatively interposed between the support and the transmission member, the frictional resistance (RC) of the third friction element being greater than the frictional resistance (RB) of the second friction element and the sum of the frictional resistances of the first and second friction elements (RA+RB) being greater than that (RC) of the third friction element, whereby in response to angular movement of the ratchet wheel, against the frictional resistance of the third friction element, the extendable part is extended to compensate for wear of the friction means.

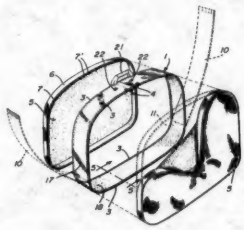
4,598,802

FOLDABLE FRAME TYPE LUGGAGE

Jacques Abenaim, 12 Joliet Street, Saint-Bruno, Canada (J3V 4Z1)

Filed Sep. 28, 1984, Ser. No. 655,538
Int. Cl.[4] A45C 7/00, 13/22
U.S. Cl. 190—107 5 Claims

1. A frame type article of luggage, collapsible from an erected, operative position to a collapsed storage position and having, when in erected position, a generally quadrangular shape, said article comprising a central band-like frame having opposite peripheral edges, a pair of flexible, foldable and tension-resistant wall panels releasably attachable to said frame along substantially the entire lengths of said opposite peripheral edges, slide fastener means to releasably attach said panels to said frame at said edges, said frame defining the bottom portion, the two bottom corner portions, the side portions, the two top corner portions and the top portion of said article when in erected position, said frame including a longitudinally and transversely rigid shallow U-shape member, and two longitudinally, resiliently flexible but transversely rigid, leg members which complete said frame, each leg having one end portion connected to an end of said U-shape member and having a hinge for folding of said leg about an axis transverse to said band-like frame, and each having an outer end, interengageable coupling means at the outer ends of the respective leg members to removably join said outer ends in substantial alignment, said U-shape member forming said bottom portion, said bottom corner portions and a minor adjacent part of each side portion and said leg members forming the major part of said side portions, the top corner portions and said top portion and said coupling means being located substantially at the center of said top portion when said article is in erected position with



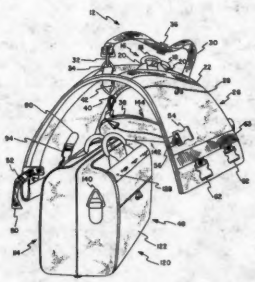
said side panels attached to said frame, said legs being then longitudinally flexed at said top corner portions and said side walls positively maintaining said leg members in said erected position, said leg members, when uncoupled and free of said side panels, taking a longitudinally straight position, the length of each straight leg being shorter than the distance between said ends of said U-shape member, said leg members, when uncoupled, foldable about said hinges in overlapping straightened-out position within said U-shape member and said side panels foldable and storable within said U-shape member under said folded, overlapped leg members, thereby defining the collapsed storage position of said article, and further including a handle detachably connectable to said top portion and straddling the outer ends of said leg members in the erected position of said article, to prevent uncoupling of said coupling means.

4,598,803

CONVENIENT AND COMPACT CARRY-ON, GARMENT BAG LUGGAGE ASSEMBLY

Mohssen Ghiassi, 12 Glen Alpine Rd., Piedmont, Calif. 94611

Filed Oct. 1, 1984, Ser. No. 656,786
Int. Cl.[4] A45C 3/00, 13/00
U.S. Cl. 190—108 7 Claims



1. A luggage arrangement that includes a number of parts

which may be releasably assembled into a compact unitary arrangement, which comprises:

a utility kit;

a carry-on bag comprising a bottom, a pair of ends, a pair of sides and a top;

a garment bag made of flexible material, said garment bag having a width substantially the same as that of a side of said carry-on bag and a length, from bottom to top, which is substantially equal to the sum of the height of each side plus the width of said top of said carry-on bag so that said garment bag may be arranged to form an inverted U-shaped arc having an interior upper portion which may be formed to fit over said top of said carry-on bag and downwardly extending sides each having a length substantially equal to that of one of said pair of sides;

means for releasably connecting said utility kit across said interior upper portion; and

strap means for releasably embracing said bottom of said carry-on bag so as to hold said carry-on bag within said U-shaped arc.

4,598,804

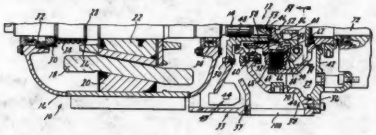
MOTOR DRIVE SYSTEM

Gordon M. Sommer, Boca Raton, Fla., assignor to Sommer Co., Warren, Mich.

Filed Feb. 24, 1984, Ser. No. 583,349

Int. Cl.[4] B60K *41/02*

U.S. Cl. 192—0.02 R **6 Claims**



1. A motor drive system comprising:

electric motor means having a first drive shaft and having means for axial movement of said first drive shaft of said motor means upon commencement of operation of said motor means; and

a clutch unit comprising,

a housing assembly comprising at least one end wall and an annular enclosure member extending from and attached to said at least one end wall, said housing assembly forming a reservoir chamber around the portion of said first drive shaft of said motor means;

a driven shaft extending from interior of said housing assembly to exterior of said housing assembly;

clutch means comprising a plurality of clutch plates rotatable with said driven shaft and a plurality of clutch discs rotatable with said first drive shaft interweaved with said plurality of plates; and

means responsive to axial movement of said first drive shaft upon commencement of operation of said electric motor means for engaging said discs and plates together to operably associate said driven shaft of said clutch unit with said first drive shaft of said motor means, comprising a fixed element disposed at one axial extreme of said plates and discs, an axially moveable element disposed at the axially opposite extreme of said plates and discs, and means for amplifying the axial movement of said first drive shaft comprising at least one pivoted member having a first portion in operable association with said first drive shaft and a second portion in operable association with said axially moveable element of said engaging means wherein said pivoted member is pivotally responsive to axial movement of said first drive shaft, wherein said pivoted member acts against said moveable element to engage said disc and plates together against said fixed element.

4,598,805

COASTER BRAKE

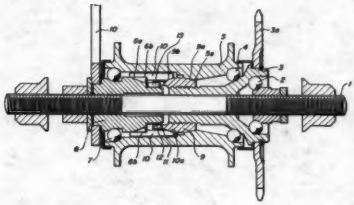
Shigeo Tomozawa, Osaka, Japan, assignor to Nankai Tekko Co., Ltd., Osaka, Japan

Filed Jul. 16, 1984, Ser. No. 631,229

Claims priority, application Japan, Feb. 28, 1984, 59-28782[U]

Int. Cl.[4] F16D *67/02*

U.S. Cl. 192—6 R **1 Claim**



1. A coaster brake comprising:

a hollow hub body;

a shaft extending through said hub body substantially along the axis of said hub body;

a male screw cylinder provided in one side of said hollow hub body and rotatably supported by said shaft, said male screw cylinder being provided with an external screw thread;

a sprocket for being driven in a first and a second rotational direction coupled to said male screw cylinder;

a brake cone provided in another side of said hollow hub body opposing said male screw cylinder and rotatably supported by said shaft, said brake cone being provided with a tapered conical surface and a cylindrical portion extending from said tapered conical surface towards said male screw cylinder and at least one projection provided on said tapered conical surface;

a screw cone having an internal thread threaded onto said external thread of said male screw cylinder, said screw cone having a tapered portion at an end of said screw cone opposing said brake cone and a notch provided in said tapered surface, said internal thread of said screw cone and said external thread of said male screw cylinder being arranged and configured such that when said male screw cylinder is rotated in said second direction and said male screw cylinder rotates relative to said screw cone, said screw cone moves towards said brake cone;

a clutch spring surrounding said cylindrical portion of said brake cone and having a projection which is engaged with said notch in said screw cone, said clutch spring being arranged configured such that when said projection is rotated in said second rotational direction, said clutch spring engages with said cylindrical portion of said brake cone; and

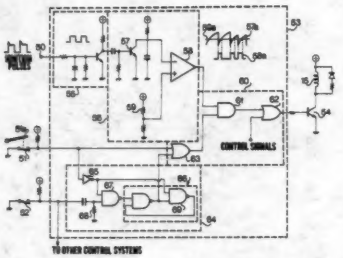
a pair of brake shoes provided in said hub body between said brake cone and said screw cone for engagement with an inner surface of said hub body when said sprocket is rotated in said second rotational direction, said brake shoes each having an inner surface which is provided at both ends with an inclined portion, said inclined portions engaging with said tapered conical surface of said brake cone and said tapered portion of said screw cone, said brake shoes further having said projection of said tapered conical surface of said brake cone provided therebetween.

4,598,806

VEHICULAR ELECTROMAGNETIC CLUTCH CONTROL SYSTEM HAVING A THROTTLE SWITCH FAILURE DETECTING CIRCUIT

Ryuzo Sakakiyama, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1985, Ser. No. 693,710
Claims priority, application Japan, Jan. 30, 1984, 59-14748
Int. Cl.[4] B60K *41/02*
U.S. Cl. 192—0.075 5 Claims



1. A system for controlling an electromagnetic clutch for a vehicle having an engine, an accelerator pedal, comprising:

a pulse generating circuit responsive to ignition pulses for the engine for producing pulses;

a clutch current control element responsive to the pulses for allowing the clutch current to flow in a coil in the electromagnetic clutch;

an accelerator switch for sensing the depression of the accelerator pedal and for producing a first signal;

sensing means for sensing a deep depression of the accelerator pedal larger than a predetermined degree and for producing a second signal;

a gate circuit responsive to the first signal for passing the pulses;

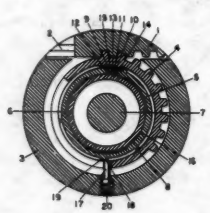
an accelerator pedal switch failure detecting circuit responsive to an inverted signal of the first signal and to the second signal for producing a third signal which is applied to the gate circuit for opening it to pass the pulses.

4,598,807

BAND AND DRUM CLUTCH

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Nov. 23, 1984, Ser. No. 674,392
Int. Cl.[4] F16D *41/20*
U.S. Cl. 192—80 1 Claim



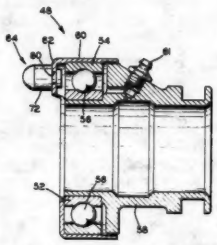
1. A band and drum clutch comprising a drum (6), a circular noncontinuous band (5) encompassing said drum (6), an outer revolving member (4) mounted coaxially around said band (5), said band (5) comprising an underlapping wedge (11) which is an integral outward projection of underlapping band end (12) and comprising an overlapping wedge (9) which is an integral inward projection of overlapping band end (10) with wedge faces (13) therebetween, said overlapping wedge (9) having a wedge head (15) associated therewith, said outer revolving member (4) having an inclined tooth (14) on an internal wall thereof, said inclined tooth (14) cooperating with said wedge head (15) to depress said wedge head (15) thus causing said wedge faces (13) to reduce the circumference of said band (5) and lock said band (5) to said drum (6) whenever said outer revolving member (4) is rotated in one direction.

4,598,808

NOISE SUPPRESSION DEVICE FOR CONSTANT RUNNING CLUTCH RELEASE BEARING

Richard A. Flotow, Butler, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Sep. 4, 1984, Ser. No. 647,249
Int. Cl.[4] F16D *23/14*
U.S. Cl. 192—98 8 Claims



1. In a friction clutch system including a plurality of clutch release levers, a release bearing assembly disposed for constant engagement with said levers, said bearing assembly including at least one drive means axially disposed for engagement with at least one of said levers; an improvement wherein said drive means comprises a cylindrical body of resilient material for direct interdigital contact wtih said lever,

said drive means further comprising a drive pin supporting said body of resilient material, said pin having a head,

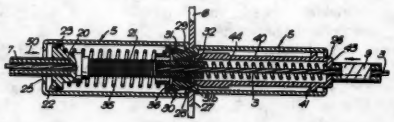
said release bearing assembly comprising an outer race, wherein said drive pin is anchored to said outer race.

4,598,809

CABLE-AND-SLEEVE CONNECTOR

John H. Glover; Edward J. Arnold, and Peter A. G. Clissett, all of Worcestershire, England, assignors to BWP Controls, Worcestershire, England

Filed Jan. 23, 1985, Ser. No. 673,972
Int. Cl.[4] F16D *13/75*
U.S. Cl. 192—111 A 3 Claims



1. A cable and a sleeve connector in which one end of the cable is connected to an actuation member and the other end is connected to a controlled member, and the sleeve extends along a curved, deformable, path between two anchors to which it is connected, the end of the sleeve remote from the controlled member is rigid and externally serrated, the anchor corresponding to that end of the sleeve provides an opening through which the cable passes and that tapers away from the controlled member, and the connection between the sleeve and the anchor means is effected by collet members disposed around the sleeve and having internal serrations that mate with the serrations of the sleeve and of which the external surfaces

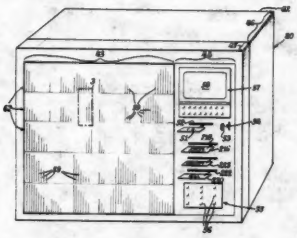
are tapered away from the controlled member and pivotally mounted at the wider ends about a mounting such that the collet members mate, and are wedged, within the opening, means being provided to urge the collet members towards this engaged condition, and means being provided that, when the actuation member is operative, permits engagement of the collet members with the sleeve and opening and that, as the actuation member moves to its inoperative condition, acts on the collet members to move them outwardly out of engagement with the sleeve, the collet members being so constrained at the mounting that their wider ends can move outwardly only to an extent that just permits the rigid parts of the sleeve to move axially of itself relatively to the collet members.

4,598,810

APPARATUS AND METHOD FOR VENDING AND ACCEPTING RETURN OF RE-USABLE ARTICLES

Barry Shore, Northbrook, and Michael Schwarzberger, Chicago, both of Ill., assignors to ABM Industries, Inc., Skokie, Ill.

Filed Apr. 17, 1984, Ser. No. 601,277
Int. Cl.[4] G07F 7/10, 11/02
U.S. Cl. 194—205 **27 Claims**



1. Vending apparatus comprising,
a vending unit containing articles to be vended, the articles having predetermined individual values,
means for receiving ID information from a patron,
record means,
means responsive to entering the ID information, and to manipulation by the patron, for vending an article and recording such vending on the record means,
means responsive to return of the article vended for recording such return on the record means,
a computer unit having means for receiving control information and putting out instructional information and control signals,
means for entering information in the computer unit representing a predetermined security deposit value corresponding to a predetermined number of aritcles, and
means controlled by the computer unit for enabling vending to each patron of only articles having a total value within said security deposit value.

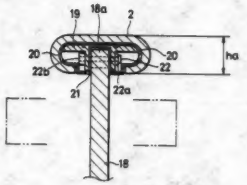
4,598,811

BALUSTRADE FOR A PASSENGER CONVEYOR

Masamitsu Hanano, and Chuichi Saito, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 406,787, Aug. 10, 1982, abandoned. This application Aug. 5, 1985, Ser. No. 762,330
Claims priority, application Japan, Aug. 28, 1981, 56-134179
Int. Cl.[4] B66B 9/14
U.S. Cl. 198—335 **3 Claims**

1. A balustrade for a passenger conveyor, comprising a handrail of a C-shaped cross-section adapted to be moved synchronously with endless moving stairs, panels comprising transparent glass plates and provided immediately under said handrail, a handrail guiding upper unit provided between upper ends of said transparent panels and a lower surface of said handrail and adapted to guide said handrail, and a lower unit provided at lower ends of said transparent panels and including inner and outer decks, said handrail-guiding upper unit comprising a guide frame having a horizontal portion and vertical portions extending downwardly therefrom and oppositing each other at a distance from each other, said vertical portions and horizontal portion forming a panel fitting groove for receiving an upper end of said transparent panel and being adapted to guide the movement of said handrail; clamping means for clamping said fitted panel in said panel fitting groove of said guide frame; a limiting member for for limiting the



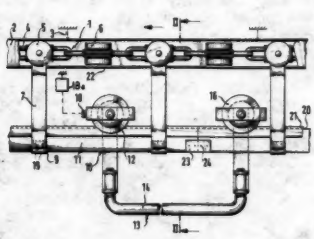
clamping force of said clamping means applied to said panel; and a guide adapted to cover an outer peripheral surface of said guide frame and slide along an inner periphery of said handrail, said handrail-guiding upper unit is located within the inside of said handrail of said C-shaped cross section and within a range of a height of said handrail, a space between an opening of the handrail and said guide frame is closed by said guide, and wherein each of said transparent panels is provided in a upper end portion thereof with recess for inserting said clamping means therethrough.

4,598,812

CONVEYER FOR SUSPENDED ARTICLES, E.G. GARMENTS

Erwin Grube, Bielefeld, and Walter Kuhlmann, Lage, both of Fed. Rep. of Germany, assignors to Durkoppwerke GmbH, Bielefeld, Fed. Rep. of Germany

Filed May 14, 1984, Ser. No. 610,243
Claims priority, application Fed. Rep. of Germany, May 13, 1983, 3317403
Int. Cl.[4] B65G 17/00
U.S. Cl. 198—343 **10 Claims**



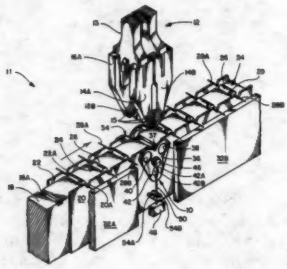
1. A suspended-article conveyer, comprising:
a horizontally flexible and vertically stiff continuous endless band disposed on edge so that the width of the band is vertical, and provided along its upper edge with a continuous bead
means for suspending and displacing said band continuously along a closed path;
at least one carriage for articles to be carried by and suspended from said band, said carriage comprising a roller riding on said bead; and
an abutment selectively interposable in the path of said

carriage for temporarily immobilizing said carriage while the band continues to move past said abutment.

4,598,813
VIBRATION DAMPING NEST FOR AXIAL LEAD COMPONENTS

Francis M. Ray, Glenview, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 6, 1984, Ser. No. 679,501
Int. Cl.[4] B65G 47/00
U.S. Cl. 198—345 **16 Claims**



1. In a system for transporting electronic components having a pair of axial leads, said system including conveyor means upon which the components are deposited by component gripper means, the improvement comprising:

damper means pivotally positioned adjacent to respective lateral portions of the conveyor assembly and including a component drop zone defined by converging surfaces and positioned generally below a component drop position of the component gripper means along the conveyor assembly for receiving the axial leads of an electronic component deposited upon the conveyor assembly by the component gripper means; and

biasing means coupled to said damper means for urging said damper means in a generally vertical orientation along said component drop position, wherein said damper means is free to pivot about said generally vertical orientation upon deposit of a component thereon when the component gripper means is positioned forward or aft of said component drop position in absorbing a substantial portion of the kinetic energy of the component and maintaining the deposited electronic component in position upon the conveyor assembly.

4,598,814
RETARDING CONVEYOR FOR CARGO WITH OUTWARD-TRANSFER STATION

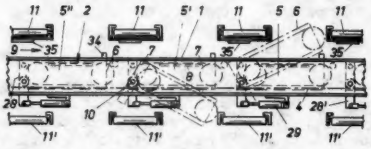
Christian Felder, Dreieichenhain, Fed. Rep. of Germany, assignor to Gebhardt Fordertechnik GmbH, Fed. Rep. of Germany

Filed Nov. 29, 1983, Ser. No. 556,120
Int. Cl.[4] B65G 47/46
U.S. Cl. 198—369 **16 Claims**

1. A retarding conveyor for cargo comprising an outward-transfer station at at least one location with a sectionally subdivided, drivable conveying means carrying the pieces of cargo, each section being drivable by an intermediate roller driven by a constantly revolving traction means,

the intermediate roller being adjustable from a driving position into an idling position by means of a feeler extending into the path of motion of the cargo, constituting an outward-transfer station,

a section of the conveying means being supported in a segmented frame tiltable about a tilting axle arranged in parallel to the conveying plane, the segmented frame being adjustable by an auxiliary force means into an inclined tilting position terminating toward a conveying means arranged at an offset level and means responsive to

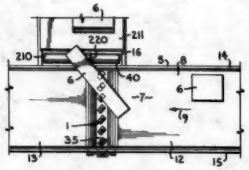


cargo contact with said feelers for engaging and disengaging drive connection between the traction means and the intermediate roller of an adjacent upstream section.

4,598,815
POWERED ROLLER DIVERTER

David J. Adams, Bedford, Tex., assignor to Conveyor Corporation of America, Inc., Crowley, Tex.

Filed Jul. 23, 1984, Ser. No. 633,515
Int. Cl.[4] B65G 47/53
U.S. Cl. 198—372 **16 Claims**



1. A diverter assembly for selectively diverting conveyed articles from a first conveyor to an intersecting second conveyor, said first conveyor having an upstream side with an article conveying surface, a downstream side, with an article conveying surface substantially coplanar with said upstream side article conveying surface, and a gap between said upstream and downstream sides in which said diverter assembly is mounted; said diverter assembly comprising:

(a) a plurality of diverter rollers positioned in said first conveyor;

(i) said diverter rollers each having an axle and a roller surface for engaging an article moving along said first conveyor and conveying momentum to said article;

(b) drive means for rotating said diverter rollers;

(i) said drive means rotating each of said rollers synchronously;

(ii) said drive means rotating said diverter rollers whenever the first conveyor is in operation;

(c) support means for mounting said diverter rollers in said first conveyor, said support means having first and second positions;

(i) said first position orienting said diverter rollers relative to said first conveyor with said roller axles generally perpendicularly aligned to a path of movement of said articles upon said first conveyor and with an uppermost portion of each of said roller surfaces positioned substantially coplanar with said article conveying surfaces of said first conveyor;

(ii) said second position orienting said diverter rollers relative to said first conveyor surfaces with said roller surfaces uppermost portions extending partially above said first conveyor to engage and partially lift an article moving along said first conveyor;

(d) a lift mechanism connected to said support means for selectively motivating said support means between said

first and second positions; said lift mechanism including an eccentric crankshaft, at least one crank arm, a clutch and a clutch-brake;

(i) said clutch and clutch-brake providing selective rotation of said crankshaft;

(ii) said crank arm being mounted on said crankshaft and connected to said support means so that rotation of said crankshaft periodically moves said support means between said first and said second positions;

(iii) said clutch-brake selectively stopping said crankshaft rotation when said support means is in a selected position; and

(e) a swivel mechanism connected to said diverter rollers for pivoting said axles out of said perpendicular alignments whenever said support means is raised by said lift mechanism and for returning said roller axles to said perpendicular alignments whenever said support means is lowered by said lift mechanism; said swivel mechanism including a driveshaft, a yoke-collar, a link mechanism and a link mechanism actuator;

(i) said link mechanism having said diverter rollers mounted thereon and having normal and diverter positions; said normal position having said diverter rollers mounted substantially coaxially to one another and said axles mounted generally perpendicular to said first conveyor path of article movement; said diverter position having said diverter rollers turned toward said second conveyor with said diverter roller axles substantially parallel to one another; said link mechanism being selectively operable by said link mechanism actuator;

(ii) said driveshaft being a portion of said eccentric shaft with a cam thereon, said cam being cylindrical, with a cylindrical surface, and having a bore therethrough;

(iii) a portion of said crankshaft extending through said bore;

(iv) said cam and said crankshaft cooperating to form said driveshaft so that any point on said cylindrical surface rotates so as to define a circle as said crankshaft and cam rotate;

(v) said yoke-collar being rotatably and slidably mounted on said cam to periodically move said yoke-collar through substantially horizontal oscillation as said driveshaft rotates; said yoke-collar being a cylindrical sleeve with a bore therethrough; said collar having a portion of said cam extending therethrough, said cam surface having a track therein defining a path circumscribing a portion of said cylindrical surface of said cam and oblique to a circular cross-section of said cam; said collar having a follower mechanism associated therewith for following said cam track and periodically moving said collar through substantially horizontal oscillation as said cam and crankshaft rotate;

(vi) said yoke-collar being connected to said link mechanism actuator, and said horizontal oscillation thereby actuating said link mechanism to move said diverter rollers between said normal and said diverter positions as said driveshaft rotates; said normal position occuring when said support means is lowered and said diverter position occurring when said support means is raised;

(vii) said lift mechanism and swivel mechanism synchronously lifting and pivoting said rollers;

(viii) said clutch permitting driving of said crankshaft and said drive shaft;

(f) whereby when said support means is in said first position articles on said first conveyor engage said diverter rollers and have momentum transferred to them by said diverter rollers, thus facilitating movement of said articles past said diverter assembly and further along said first conveyor; and

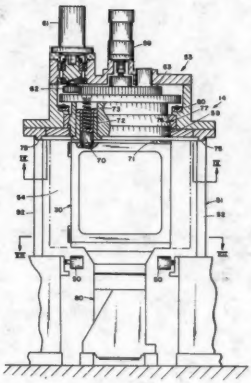
(g) whereby when said support means is in said second position said diverter rollers engage said articles and lift and divert same toward said second conveyor, while simultaneously conveying momentum to said articles.

4,598,816

METHOD AND MEANS FOR JIGGING WORKPIECE FOR MACHINING

Carl R. Kutzli, 2801 Ridge Rd., Highland, Mich. 48031, and James D. Rutter, 6615 Fairfield, Garden City, Mich. 48135

Filed Aug. 6, 1984, Ser. No. 637,861
Int. Cl.[4] B65G *37/00*
U.S. Cl. 198—465.1 **21 Claims**



2. Means for machining workpieces including a station and a rigid inflexible cubical fixture cage for holding a workpiece within said fixture cage in a predetermined and fixed position with respect to the geometric center of the fixture cage, said fixture cage having locator means adjacent each of the corners of two adjacent faces and spaced an equal and precise distance from said geometric center; a pair of indexing means on each of the same faces, each of said pairs being centered about one of the axes of the cage passing through the cage's geometric center; said station having a fixture supporting cell, the cell having a stationary frame defining an internal chamber of a size and shape to receive a fixture cage, at least one side of the chamber being open to provide access for machine tools, another side being open and through which the fixture cage can be entered and removed; a stationary index member at the top of the cell having an accurately located lower surface serving as a vertical reference for the machine tools at the station; means within the cell for lifting a fixture cage and pressing and holding the locator means of one face of the fixture cage against said lower surface of said index member, a pair of locator elements depending from the top of said chamber for engaging said indexing means of the fixture cage and accurately positioning the fixture cage about its vertical axis with reference to a vertical plane indexed to the machine tools at the station and passing through the geometric center of the fixture cage.

4,598,817

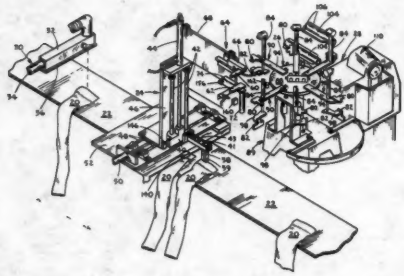
LOADING SYSTEM FOR A TOE CLOSING ASSEMBLY

Cecil R. Bell, Jr., Pinnacle; Willie M. Lathery, Germanton; Navin D. Patel, and Jasper R. London, both of Winston-Salem, all of N.C., assignors to Sara Lee Corporation, Winston-Salem, N.C.

Division of Ser. No. 297,315, Aug. 28, 1981, Pat. No. 4,539,924. This application Jul. 17, 1985, Ser. No. 755,790
Int. Cl.[4] B65G *25/00*
U.S. Cl. 198—468.2 **6 Claims**

1. The method of conveying a tubular hosiery blank having a welt end portion and a toe end portion to an elongated suction tube of a toe closing machine having sewing instrumentalities comprising the steps of; transferring the hosiery blank from

a supply source to a conveyor, orienting the blank in a prescribed manner upon the conveyor with the welt end portion positioned upon the conveyor, conveying the blank to a prescribed location, gripping the welt end portion and transferring the blank from the conveyor to a predetermined position,



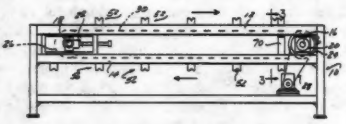
spreading open the welt end portion of the blank at the predetermined position, conveying the blank along an arcuate path to an elongated suction tube of a toe closing machine, positioning the blank upon the elongated suction tube while maintaining the welt end in an expanded condition and everting the blank.

4,598,818

ACCUMULATING CONVEYOR

Jack E. Miller, St. Clair Shores, Mich., assignor to Harry Major Machine & Tool Co., Fraser, Mich.

Filed Aug. 1, 1985, Ser. No. 761,584
Int. Cl.[4] B65G *17/00*
U.S. Cl. 198—803.2 **7 Claims**



1. For use in combination with an accumulating conveyor comprising a pair of like end sprocket means of like radius mounted for rotation about spaced, parallel, horizontal axes, and endless multiple-strand roller chain, at least one strand of said chain being operatively trained in tension about said end sprocket means, means for supporting and guiding said one strand of said chain along horizontal upper and lower runs extending between said sprocket means, a second strand of said chain being supported by said one strand laterally clear of said sprocket means and said means for supporting and guiding, and drive means for driving said chain in continuous movement along an endless path:

an article carrier adapted to be mounted on said second strand of said chain, said carrier including mounting means mounted on the carrier and engaged with said second strand to support the carrier upon said second strand and operable to frictionally couple the carrier to said chain when the carrier is on the upper or lower run of the chain;

said carrier having a frame and said mounting means comprising a rigid outer support plate and a rigid inner support plate fixedly mounted on said frame to be respectively located at the outer and inner side of the endless path of movement of said second strand, said support plates having opposed chain engaging edges including opposed straight edge sections extending in fixed, spaced relationship to each other and spaced from each other by a distance greater than the diameter of the rollers of said chain, the straight edge section of said outer support plate having a length sufficient to span a plurality of rollers of said chain to stably support said carrier upon said second strand of said chain when said carrier is located on said upper run and the straight edge section of said inner plate having a length sufficient to span a plurality of rollers of said chain to stably support said carrier upon said second strand when said carrier is located on said lower run, said chain engaging edge of said inner plate terminating at opposite ends in beveled edge sections inclined from the straight edge section inwardly of said endless path at an obtuse included angle,

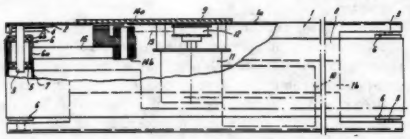
the fixed spacing between the chain engaging edges of said inner and outer plates and the length of the straight edge section of said inner plate being related to the radius of said sprocket means and the pitch of said chain such that during transit of said plates around the curved portions of said endless path defined by said sprocket means said edge on said outer plate contacts the outer side of one roller of said second strand, the chain engaging edge section of said inner plate contacts at least two rollers of said second strand respectively spaced ahead and behind said one roller with respect to the direction of travel of said chain, and at least one beveled edge section of said chain engaging edge of said inner plate simultaneously engages a roller of said second strand adjacent one of said two rollers.

4,598,819

BELT CONVEYOR STRUCTURE

Wolfgang Siegwart, Sulzbach, Fed. Rep. of Germany, assignor to Sipavag AG, Switzerland

Filed Feb. 16, 1984, Ser. No. 580,707
Claims priority, application Switzerland, Mar. 3, 1983, 1163/83
Int. Cl.[4] B65G *21/14*
U.S. Cl. 198—861.1 **4 Claims**



1. An adjustable width belt conveyor structure comprising: a pair of identical longitudinally extending angle members, each having a first leg forming a top surface and a second leg forming a side surface; an intermediate transverse member of selected width connected fixedly between said first legs of respective said angle members so as to position one of said angle members in spaced apart substantially parallel relationship with the other said angle member; a journal pin connected to said second leg of each of said angle members, said pins being axially aligned with one another and extending between said second legs; a sleeve rotatably supported on each one of said journal pins, said sleeves being identical and being disposed in spaced aligned relationship between said second legs; a roller tube of selected width detachably mounted between and engaged coaxially over said sleeves; each of said sleeves having a cylindrical portion extending at least partly and being fixed to said roller tube, each of said sleeves having an axially outer portion extending axially outwardly of said roller tube, said cylindrical portion of each sleeve extending radially inwardly of said outer portion of each sleeve, said outer portion of each sleeve tapering slightly axially outwardly of said roller tube; a conveyor belt of selected width trained over said roller tube; drive means; and, a drive belt associated with said main drive means being engaged over said cylindrical portion of one of said sleeves wherein, the width of the conveyor belt structure may be adjusted by changing the width of the intermedi-

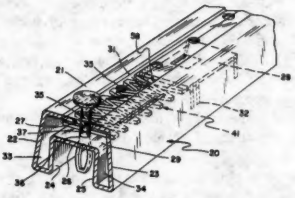
ate transverse member selected, the width of the roller tube selected and the width of the conveyor belt selected.

4,598,820

SPRING FOR TUBULAR IC CARRIERS

Robert H. Murphy, 1 Timber La., Merrimack, N.H. 03054

Filed Oct. 31, 1984, Ser. No. 666,888
Int. Cl.[4] B65D 73/02
U.S. Cl. 206—328 6 Claims



1. A device for insertion in one of the opposite ends of a tubular carrier for integrated circuits, to secure the same from sliding and chipping therein during transport, said device comprising:

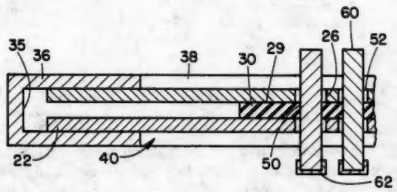
an elongated, longitudinally flat, thin one piece rectangular elastomeric plastic body, said body comprising a length, a width and a thickness, said width being smaller than said length but larger than said thickness, said body having a longitudinal, central axis, one end shaped as a finger grip, an opposite end shaped to flatwise engage an integrated circuit, and having a plurality of integral rhombus shaped sections extending between said ends, to form a longitudinally compressible, laterally expansible spring adapted to yield, widen and compress to serve as a shock absorber for integrated circuits slidably housed in said tubular carrier.

4,598,821

HOLDER ASSEMBLY FOR MINIATURE ELECTRONIC COMPONENTS AND METHOD OF FABRICATION

A. Franklin LaBarbara, Eaton's Neck; Jeffrey Cann, Islip, and Carey Evans, Huntington, all of N.Y., assignors to Phase Industries Inc., Huntington Station, N.Y.

Filed Nov. 7, 1983, Ser. No. 549,476
Int. Cl.[4] B65D 73/02
U.S. Cl. 206—329 8 Claims



1. A holder assembly for miniature electronic components, comprising:

a first thin, flat plate having a multiplicity of first holes therein;

a second thin, flat plate having a multiplicity of second holes therein each centrally aligned with one of said first holes; and

a thin sheet made of heat resistant, tough, flexible elastic material disposed between said first and second plates and bonded at opposite sides thereof to both of said plates to form a laminated assembly whose thickness is determined by the thicknesses of said plates and said sheet, said sheet having a multiplicity of third holes therein, each of said third holes being centrally aligned with said aligned first and second holes, said third holes being smaller than said first and second holes to define an elastic annular rim around each of said third holes for frictionally gripping one of said components inserted through said aligned first, second, and third holes, the length of each of said components being longer than said thickness of said laminated assembly to project at opposite ends thereof outwardly of said laminated assembly for processing all the ends of said components simultaneously.

4,598,822

DRILL BIT CARRYING CASE

David T. Hemmings, Orange, Calif., assignor to Megatool Inc., Buena Park, Calif.

Filed Feb. 19, 1985, Ser. No. 703,220
Int. Cl.[4] B65D 85/24
U.S. Cl. 206—379 2 Claims

1. A carrying case for drill bits comprising:

a. a rectangular lid panel having generally flat, parallel upper and lower surfaces, and thin rectangular flanges projecting downward from the long front edge and shorter side edges of the said lid panel,

b. a rectangular base panel having generally flat, parallel upper and lower surfaces, and thin rectangular flanges projecting upward from the long front edge and shorter side edges of said base panel,

c. an elongated rectangular back panel pivotably fastened on a long upper edge of said back panel to the rear edge of said lid panel, and pivotably fastened on a long lower edge of said back panel to the rear edge of said base panel,

d. an elongated drill holder block extending perpendicularly outward from the inner surface of said back panel, said drill holder spanning a substantial portion of the length of said back panel and containing a plurality of parallel cylindrical bores extending downward from the flat upper surface of said block,

e. fastening means for securing the said lid panel and said base panel in parallel alignment, with said lid panel flanges and said base panel flanges overlapping to cooperate with said lid panel, said base panel and said back panel to form a rectangular closed box, and

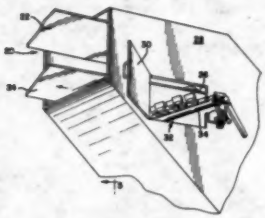
f. means responsive to said pivotal motion between said drill holder block and at least one of said lid panel and said base panel in securing drills inserted into said drill holder block bores against longitudinal movement out of said bores, said drill securing means comprising in combination an aperture in a vertical face of said drill holder block communicating with said bores, and a projecting member projecting inward from the surface of an adjacent closure panel effective in exerting compressive pressure on the shanks of drills inserted into said drill holder block.

4,598,823

CONVEYOR BELT CLEANER

Robert T. Swinderman, Kewanee, Ill., assignor to Martin Engineering Company, Neponsit, Ill.

Filed Feb. 13, 1984, Ser. No. 579,707
Int. Cl.[4] B65G 45/00
U.S. Cl. 198—497 1 Claim



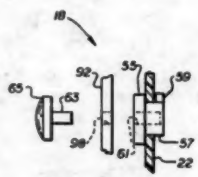
1. A conveyor belt cleaning arrangement consisting of a linear support member disposed transverse to the direction of conveyor belt travel, a flange extending radially outwardly from said support member, connector means consisting of slots formed in said flange adapted to locate and position individual belt cleaner blades, and one or more belt cleaner blades formed of an elastomeric material, each of said blades including locking means consisting of a groove disposed laterally through its lower end such that a pair of legs are defined, one disposed on each side of said groove, and a lug disposed in said groove between said legs, said lug adapted to matingly engage said slot in said flange to releasably lock said blade to said support member so as to prevent linear movement of said blade along said support member and to hold said blade in position for cleaning said conveyor belt.

4,598,824

STORAGE CONTAINER FOR FLOPPY DISKS AND THE LIKE

Jerry M. Long, Pleasanton, and James A. Womack, Los Gatos, both of Calif., assignors to Innovative Concepts, Inc., San Jose, Calif.

Filed Aug. 31, 1984, Ser. No. 646,636
Int. Cl.[4] B65D 85/57
U.S. Cl. 206—444 9 Claims



1. A container for storing floppy disks and the like, comprising:

a base member including means forming a floor, oppositely disposed side walls, a back wall including a rear finger grip centrally formed as a part thereof and a forwardly inclined front wall having a height substantially less than said side wall, said front wall including a front finger grip forming a central part thereof, the floor of said base portion including both front and rear pairs of legs formed therein and a plurality of guide slots;

a cover member including means forming a ceiling, oppositely disposed downwardly extending side walls, a rear wall and a forwardly inclined front wall which has a length greater than said rear wall for mating with said inclined front wall of said base portion;

means for pivotally interconnecting said base portion with said cover portion so that the cover portion may be rotated away from said base portion to an open position to permit access to said disks or to a closed position to protect said disks from contaminants such as dust and the like, said interconnecting means including

a pivot aperture formed in each side wall of said base member, each said pivot aperture including a notch,

a pivot locking member including a spacer portion, an axial extension from said spacer portion and a tab at the distal end of said axial extension, said tab passing through said notch and said spacer end being adjacent the exterior of said side wall, the spacer end including an axial aperture,

a pivot pin aperture formed in each said downwardly extending side wall of said cover member, said pivot pin aperture including a flat,

a pivot pin having a shoulder and an axial extension including a flat and adapted for insertion through said pivot pin aperture of said cover member and into said axial aperture of said pivot locking member, and

means for affixing said pivot pin to said locking member; and

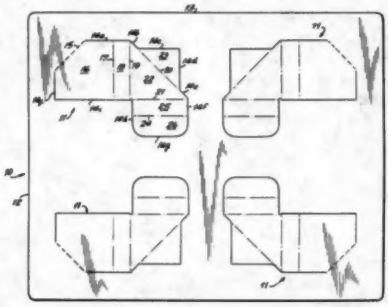
stop means for holding said cover member in a predetermined orientation relative to said base member when in open position.

4,598,825

CORNER PROTECTOR FOR PICTURE FRAMES AND THE LIKE

Teddy E. Wiley, and James C. Payne, both of Russellville, Ark., assignors to International Paper Company, New York, N.Y.

Filed Dec. 27, 1984, Ser. No. 686,945
Int. Cl.[4] B65D 85/48; A47G 1/06
U.S. Cl. 206—453 2 Claims



1. A package formed from a blank of corrugated board, paperboard or the like for protecting the corners of an article packaged therein, such as a picture frame or the like, which comprises:

(a) said blank having a plurality of polygonal, die-cut, multi-paneled flaps captured from the interior of the blank and adapted to be formed into a corner of the packaged article;

(b) each of said flaps comprised of a series of foldably interconnected corner forming panels, namely, a backing panel, a top corner panel, a triangular face panel, an inner triangular panel, a side corner panel, and a frictional engaging panel;

(c) said multi-paneled flap being folded though an angle of substantially 180 degrees whereby the inner face of the backing panel is in substantially face-to-face contact with a surface of the blank;

(d) folding the remaining corner forming panels to create a corner receiving pocket, comprised of:

(i) the top and side corner forming panels being foldably connected at an angle of substantially 90 degrees;

(ii) the triangular face panel forming the outer surface of the corner receiving pocket and being foldably connected along one side to the top corner panel and along another side to the side corner panel;

(iii) an internal triangular panel being foldably connected to the triangular face panel along its third side with its apex located interiorly of the corner receiving pocket whereby it maintains the picture frame in position;

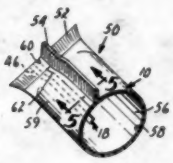
(iv) a frictional engaging panel foldably connected to the side corner panel and disposed in frictional engagement between the backing panel and the surface of the blank whereby the corner receiving pocket is maintained in position.

4,598,826

HEAT-SEALABLE, LAMINATED PACKAGE

Madeline P. Shinbach, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 9, 1984, Ser. No. 670,147
Int. Cl.[4] B65D 33/30
U.S. Cl. 206—620 3 Claims



1. A package comprising:

a. a laminate sheet material including:

(1) a metal foil highly impervious to air and water vapor;

(2) a puncture resistant outer material laminated to one major surface of said metal foil; and

(3) a heat-sealable plastic inner film laminated to the major surface of said metal foil opposite said outer material, said heat-sealable plastic inner film including (a) sealed portions forming a pouch of said laminate sheet material, said pouch having at least one interior wall and at least one exterior wall, and said sealed portions providing stiffened portions highly impervious to air and water vapor, and (b) unsealed portions comprising said interior wall of said pouch; and

b. means for facilitating tearing of said sheet material along a predetermined path across said pouch, said means comprising:

(1) at least one length of heat-sealable, polymeric, tear resistant strip material laminated across said interior wall of said pouch to provide another stiffened portion of said pouch and having a first end portion sealed to and extending between said sealed portions of said pouch to highly preclude the passage of air and water vapor between said sealed portions and said first end portion of said length of strip material;

(2) said pouch having two closely-spaced stiffened portions on opposite sides of said predetermined path at least one of which includes the length of tear resistant strip material; and

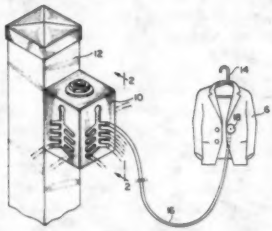
(3) cut means at one end of said predetermined path for facilitating tearing said pouch along said predetermined path between said two closely-spaced stiffened portions.

4,598,827

VERSATILE GARMENT SECURITY DEVICE

Terry A. Kelfer, 20B Congressional Cir., Flying Hills, Reading, Pa. 19607

Filed Jan. 14, 1985, Ser. No. 691,072
Int. Cl.[4] A47F 7/19
U.S. Cl. 211—4 7 Claims



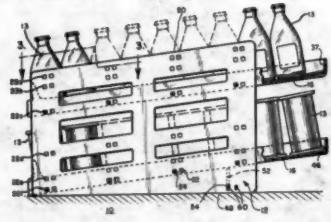
1. A system for securing display items to a fixture or the like comprising a housing adapted to be secured to the fixture, a plurality of elongated cables for securing the display items to the fixture, each cable having means at one end securing it to the display item and detachably secured in the housing at its opposite end, means defining cable retention and release channel means in said housing for a plurality of said cables, said channel means having an enlarged entrance portion and being of a configuration including a manifold channel and at least two branch channels disposed angularly relative to said manifold channel, to permit insertion and removal of said opposite end of any one of said cables whereby any one of said cables may be inserted or removed individually and locking means actuatable between a position blocking said entrance portion of said channel means and a second position permitting movement of cables from said channel means through said entrance portion, said cable retention and release channel means comprising at least one elongated manifold channel of predetermined cross section having a series of pairs of brahcn channels of similar cross section emanating from said manifold channel and an entrance slot portion at one end of said manifold channel of greater cross sectional opening than said manifold channel, and wherein said cable is of predetermined cross section less than the channels and the cable securing means at said opposite end is of said greater cross section than said channels and of a cross section to permit insertion and removal through said entrance slot portion.

4,598,828

STORAGE AND DISPENSING RACK

Raymond R. Young, Glenview, and John F. Deffner, Lisle, both of Ill., assignors to Visual Marketing, Inc., Chicago, Ill.

Filed Feb. 22, 1983, Ser. No. 468,078
Int. Cl.[4] A47F 1/00
U.S. Cl. 211—59.2 3 Claims



1. A rack for storing and dispensing individual containers of

a generally cylindrical shape, including glass containers, said rack comprising:

two identical side members, each side member including a plurality of apertures, a first support edge, and a second support edge which is slanted in relation to said first support edge;

at least one shelf, said shelf including means for removably engaging said apertures on said side members so that said side members support said shelf and said shelf cooperates with said side members to support cylindrical containers in an upright position;

a first row of said apertures positioned on each of said side members so that, when said first support edges rest on an inclined surface, said shelf assumes a slanted orientation with respect to a level surface, thereby allowing the containers on said shelf to slide to the lowest end of said shelf;

a second row of said apertures positioned on each of said side members so that, when said second support edges rest on a level surface, said shelf maintains a slanted orientation with respect to the level surface, thereby allowing the containers on said shelf to slide to the lowest end of said shelf;

said shelf further including a front portion having first and second slots and a channel positioned below said slots; and

an identification plate having a lower edge and first and second hooks appended to an upper edge, said first and second hooks engaging said first and second slots and said lower edge of said identification plate snapping into said channel to secure said identification plate to said front portion.

4,598,829

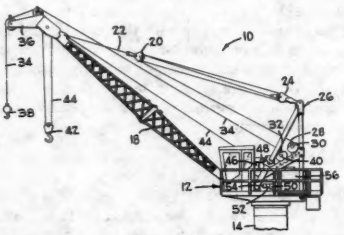
HYDRAULIC CIRCUIT FOR CRANE

Rickie A. Young; David L. Willard, and Gerald P. Berger, all of Cedar Rapids, Iowa, assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 508,972, Jun. 29, 1983, abandoned. This application Jun. 20, 1985, Ser. No. 746,944

Int. Cl.[4] B66C *13/18*

U.S. Cl. 212—149 **2 Claims**



1. A hydraulic circuit for a pedestal mount crane having a boom pivoted on an upper works, main and auxiliary lift hooks suspended from the boom, an engine and a reservoir mounted on said upper works; said circuit comprising:

a lift hook pump and a boom hoist pump driven by said engine;

a boom control valve means connected with said boom hoist pump for controlling upward and downward angular travel of said boom;

an unloading valve means interposed between said boom hoist pump and said control valve means and normally positioned to provide free communication therebetween;

lift hook valve means connected with said lift hook pump for independent control of said lift hooks;

said unloading valve means having a passage provided with an orifice therein connected to said lift hook pump;

a pressure relief valve means for sensing the pressure in said passage and connected to establish flow through said orifice to said reservoir in response to a predetermined pressure in said passage;

means for shifting said unloading valve means from the normal position to an unloading position connecting said boom hoist pump with said reservoir when flow through said orifice is established;

a conduit connecting said passage to said reservoir; a boom travel limit valve means interposed in said conduit and noramlly biased to a closed position in which said conduit is blocked from communicating with said reservoir;

boom actuated means for shifting said boom travel limit valve means to an open position communicating said passage with said reservoir in response to the boom reaching predetermined upward and downward angular limits of travel; and

an override valve interposed in said conduit and normally biased to permit flow therethrough to said boom travel limit valve means and movable to a position in which flow therethrough is blocked disrupting communication of said boom travel limit valve means with said reservoir in the open position thereof and the flow through said orifice into said conduit.

4,598,830

SELF-LEVELLING BOOM ARRANGEMENT FOR AN AGRICULTURAL MATERIAL DISTRIBUTION DEVICE

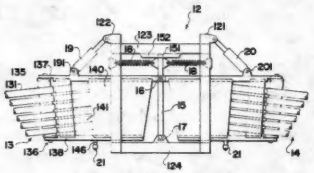
Grant Fletcher, Crossfield, Canada, assignor to Redi-Go Farm Services (1980)Ltd., Crossfield, Canada

Filed Feb. 21, 1985, Ser. No. 703,919

Claims priority, application Canada, Jan. 21, 1985, 472483

Int. Cl.[4] B66C *23/72*

U.S. Cl. 212—195 **11 Claims**



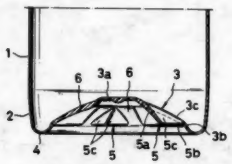
1. A self-levelling boom arrangement for supporting upon a frame of an agricultural material distribution device comprising a pair of boom arms each arranged to extend outwardly to one side of the frame and including means for spreading said material along the length of the arms, a central support member, means mounting said central support member on said frame for free side to side movement relative thereto under forces applied thereto by the boom arms, means for spring biasing said central support member toward a central position thereof, pivotal mounting means mounting each of said arms on said central support member such that each arm can pivot independently relative thereto about a substantially horizontal axis at right angles to the length of the arm but is held against lateral movement relative thereto, and two linkage means each having one end thereof pivotally connected to a respective one of said arms at a position spaced from said pivotal mounting means and an opposed end thereof pivotally attached to said frame such that each arm is solely supported by said pivotal mounting means and a respective one of said linkage means, each said linkage means including means for increasing and reducing the effective length thereof so as to raise and lower the respective arm independently of the other arm whereby said boom arms can be independently raised and lowered by said linkage means and whereby common side to side movement of said central support member and arms provides a self-levelling effect to tend to accommodate tilting of the frame relative to the vertical.

4,598,831

HEAT-RESISTANT SYNTHETIC RESIN BOTTLE

Yoshinori Nakamura, and Yoshiki Miyazawa, both of Sakakimachi, Japan, assignors to Nissei ASB Machine Co., Ltd., Japan

Filed Oct. 25, 1984, Ser. No. 664,503
Claims priority, application Japan, Oct. 31, 1983, 58-168962[U]
Int. Cl.[4] B65D *1/02, 1/42, 23/00*
U.S. Cl. 215—1 C 3 Claims



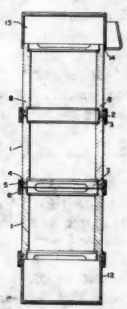
1. A heat-resistant synthetic resin bottle which is biaxially oriented by axially stretching and air blowing an injected or extruded closed-end parison in a blow mold to carry out molding, whereby a bottom wall of said bottle is recessed toward its interior in the form of a dome and an annular peripheral edge for supporting said bottle itself is formed around said bottom wall, characterized in that a top portion of said bottom wall which is formed gradually thickening from said annular peripheral edge to a central portion thereof and is recessed upwardly from the underside of said top portion itself in order to thin said top portion, and said bottom wall between said top portion and said peripheral edge is partially outwardly additionally curved in order to radially form a predetermined number of triangular pyramid-shaped recessed sections having a pair of connected bottom walls and bottom lands between said recessed sections.

4,598,832

SYSTEM OF COUPLING CYLINDRICAL, SECTIONED CONTAINERS

Ildefonso N. Alonso, P.O. Box 6106, Caracas 1010-A, Venezuela

Filed Nov. 13, 1984, Ser. No. 670,493
Int. Cl.[4] B65D *6/24*
U.S. Cl. 215—6 10 Claims



1. A system for coupling two cylindrical sections of a container, one above the other, comprising:

first cylindrical means having external threads,

second cylindrical means having internal threads and including a holding ring fixed within said second cylindrical means against rotation relative thereto;

said one section having a lower end including circumferentially disposed internal threads and a circumferentially extending external groove;

said other section having an upper end including internal and external circumferentially extending threads,

said first cylindrical means engaging at least the internal threads of said one section lower end,

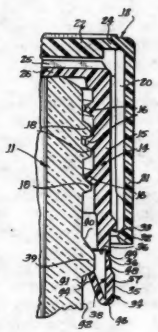
said second cylindrical means being rotatably mountable on the lower end of said one section via engagement of said holding ring in said groove, said internal threads of said second cylindrical means being engageable with the external threads of said other section upper end, whereby upon rotation of said second cylindrical means relative to said one section, said second cylindrical means internal threads cooperate with said external threads of said other section upper end to secure the latter in firm proximal contact with the lower end of said one section.

4,598,833

TAMPER-EVIDENT CHILD-RESISTANT CLOSURE

James E. Herr, East Petersburg, Pa., assignor to Kerr Glass Manufacturing Corporation, Los Angeles, Calif.

Filed Aug. 29, 1985, Ser. No. 770,681
Int. Cl.[4] B65D *55/02*
U.S. Cl. 215—220 9 Claims



1. A child-resistant, tamper-evident closure for sealing an open-topped container having an external screw thread formed on the neck of the container and an outwardly projecting annular shoulder formed below the screw thread, the closure comprising:

an outer cap having a top end wall and a skirt depending from the outer edge thereof;

an inner cap having a top end wall and an internally threaded skirt depending from the outer edge thereof for engagement with the external screw thread on the container, the outer cap overlying the inner cap and being concentric therewith;

first ratchet teeth on the respective caps abutting when the outer cap is turned in the application direction to rotate the two caps together and causing the internal threads on the inner cap to cooperate with the external screw threads on the container to fasten the closure onto the container, the first ratchet teeth of the respective caps sliding over each other when the outer cap is turned in the removal direction;

second ratchet teeth on the respective caps abutting when a downward force and a torque are simultaneously applied on the outer cap in the removal direction for turning the inner cap to release the closure from the container;

tamper-indicating means comprising a ring depending from the lower edge of the skirt of the inner cap, breakable connector means for detachably securing a lower portion of the ring to the inner cap skirt, and a plurality of tabs bent upwardly and radially inwardly from the ring for

engaging the annular shoulder of the container during the removal of the closure to break the ring away from the inner cap skirt.

4,598,834

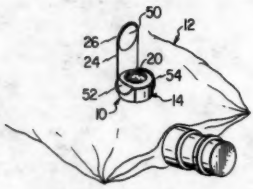
FLEXIBLE STERILE CLOSURE SYSTEM FOR A CONTAINER WITH A SIDE INJECTION PORT

Winfield S. Singletary, Jr., Garland, Tex., assignor to U.S. Clinical Products, Inc., Richardson, Tex.

Filed Feb. 6, 1985, Ser. No. 698,917

Int. Cl.[4] B65D *41/32*

U.S. Cl. 215—232 **64 Claims**



1. A flexible sealing cover for resealing the side injection port of a pharmaceutical container, the port having a cylindrical portion extending from the container and an injectable membrane at the exposed end of the cylindrical portion, the sealing cover including:

a cover region having a center portion and first and second end portions extending from opposite sides of the center portion;

a pull tab region extending from one of the end portions of the cover region;

said cover region having a nonadhesive area on a first side thereof for covering the injectable membrane with the remainder of the first side having adhesive for securing the cover region to the port;

said center portion of the cover region being adhesively secured to the port about the periphery of the injectable membrane, said center portion having protrusions extending from the edges thereof between the end portions for folding against the cylindrical portion of the port for adhesive attachment thereto;

each of said end portions for folding against the cylindrical portion of the port for adhesive attachment thereto and having protrusions extending on opposite sides of the end portions for wrapping about a portion of the cylindrical portion to enhance the attachment; and

means for tearing the cover along at least one tear line upon its removal with said pull tab region from the port to leave a telltale mark that the seal has been broken.

4,598,835

ONE-PIECE PLASTICS CLOSURE

Thomas D. Brownbill, Stepwood, England, assignor to Metal Box Public Limited Company, Berkshire, England

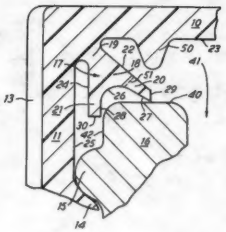
Filed Oct. 22, 1984, Ser. No. 663,238

Claims priority, application United Kingdom, Oct. 29, 1983, 8328954

Int. Cl.[4] B65D *53/00*

U.S. Cl. 215—307 **7 Claims**

1. A one-piece plastics closure for a container having a mouth-defining free end surface and a side surface, the closure having a closure panel, a skirt depending peripherally from the closure panel, and an annular sealing member located adjacent the junction of the closure panel and the skirt and attached by an integral flexible hinge allowing pivotal movement of the sealing member independently of the closure panel and the skirt, the sealing member having a first portion located for engagement with the free end surface of a said container when the closure is fitted on the container, and a second portion located so as in response to such engagement of the first portion by the container and consequent pivotal action of said



hinge to be urged into engagement with the side surface of the container and thereby form a side seal for the container.

4,598,836

PRESSURE GAS CONTAINER

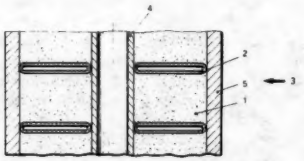
Otto Wessel, Duisburg, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Oct. 12, 1984, Ser. No. 660,200

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1983, 3338879

Int. Cl.[4] B65D *25/00*

U.S. Cl. 220—3 **12 Claims**



1. A pressure gas container of a predetermined volume for the storage of hydrogen on the basis of a gas/solid reaction and which is filled with a storage material, characterized in that at least one compressible impervious elastic element is enclosed within the storage material and is adapted to have its volume compressed by a pressure action by the storage material (1) and which is made of a material which is stable at the temperatures occurring when the pressure gas container (3) is charged with hydrogen and discharged said elastic element being so embedded in the storage material and the container volume is completely filled with the storage material when in a gas charged and discharged state.

4,598,837

END CLOSURE WITH TAMPER EVIDENT ELEMENT

Walter J. Kreiseder, Barrington, and Allen J. Vogel, Schaumburg, both of Ill., assignors to Courtesy Mold & Tool Corporation, Wheeling, Ill.

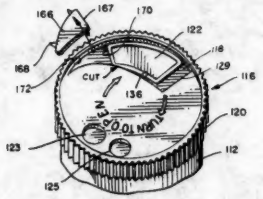
Continuation-in-part of Ser. No. 683,068, Dec. 18, 1984, Pat. No. 4,567,995. This application Oct. 3, 1985, Ser. No. 783,732

Int. Cl.[4] B65D *51/18*

U.S. Cl. 220—253 **6 Claims**

1. An end closure for a container comprising a first imperforate stationary part and a second movable part, means for rotatably securing the first part and the second part to one another, said first part having a raised portion secured thereto by severable wall means and said second part having an opening therein for receiving said raised portion, said opening defined at least in part by knife means for severing said severable wall means

upon rotational movement of said second part with respect to said first part and for urging the cut raised portion from said first part, and a tamper evident element secured to the second



movable part and adapted to be dislodged from the cover upon initial movement of the second part relative to the first part in a direction to sever the severable wall means.

4,598,838

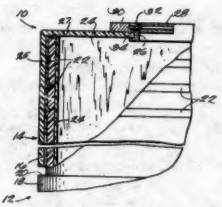
TRASH RECEPTACLE

Jerome A. Zakrajsek, Fredonia, Wis., assignor to DCI Marketing, Milwaukee, Wis.

Filed Jan. 18, 1985, Ser. No. 692,397

Int. Cl.[4] B65D *25/16*

U.S. Cl. 220—404 **5 Claims**



1. A trash receptacle comprising

a cylindrical container including a closed lower end, an open upper end, an upper portion having a height and an outside diameter, and a lower portion having an outside diameter greater than the outside diameter of said upper portion, said container having an outer surface and including a plurality of ribs extending circumferentially around said outer surface on said upper portion of said container, and said container removably containing a plastic garbage bag having its upper end folded over said upper end of said container, and

a cylindrical cover member having a height less than the height of said upper portion of said container, and an outside diameter substantially equal to the outside diameter of said lower portion of said container, said cover member including a tubular side wall, a generally planar top wall perpendicular to said side wall and having therein a trash receiving opening, and an open lower end, said cover member fitting over and surrounding said upper portion of said container with said top wall of said cover member resting on said upper end of said container with said garbage bag secured between said upper end of said container and said top wall of said cover member and between said ribs and said side wall of said cover member, and with said cover member covering the portion of the garbage bag folded over the upper end of the container.

4,598,839

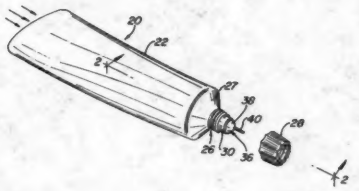
TAMPER EVIDENT SQUEEZE TUBE

Edward Dombroski, Sea Girt, and Richard W. Potts, North Caldwell, both of N.J., assignors to Peerless Tube Company, Bloomfield, N.J.

Continuation-in-part of Ser. No. 462,929, Feb. 1, 1983, Pat. No. D. 281,055. This application May 17, 1983, Ser. No. 495,526

Int. Cl.[4] B65D *35/00*

U.S. Cl. 222—92 **8 Claims**



1. A tamper evident squeeze tube comprising:

a hollow elongated tube having flexible walls;

a sealing means at one end, which end is used for filling the tube prior to sealing;

a dispensing head at the other end comprising:

a neck having an opening therein to the interior of the tube; and

a frangible sealing member mounted across the opening for sealing the opening and indicating tampering with the contents therein;

a cap adapted to be mounted to the exterior of the neck which cap includes a chamber for enclosing the sealing member when the cap is mounted to the neck and coating with the neck and sealing member to prevent the sealing member from fracturing while the tube is being filled, said sealing member being integral with the neck and being of a flexible dome shape, the interior of the cap including means for forcing the dome into the interior of the opening while the cap is being mounted to the neck and maintaining the dome therein while the tube is being filled.

4,598,840

SNAP-IN CARTRIDGE DILUTER

Donald E. Burg, 15840 SW. 84 Ave., Miami, Fla. 33157

Filed Oct. 11, 1983, Ser. No. 540,291

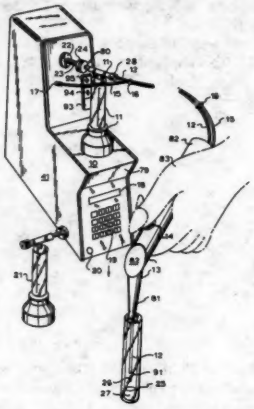
Int. Cl.[4] B67D *5/52*; B01L *3/02*

U.S. Cl. 222—135 **50 Claims**

1. In an improved fluid handling device having at least one main body element, fluid passage means, and at least one fluid container that includes a plurality of pistons, the pistons connected to and position controlled by precision distance moving means, said pistons disposed within cylinders that are in fluid communication with the fluid passage means whereby piston movement accomplishes fluid pickup and discharge through the fluid passage means, wherein the improvement comprises:

a valveless fluid cartridge assembly having a separate piston cylinder for each piston, the assembly being readily detachable from the main body element such that the sepa-

rate pistons disconnect from the precision distance moving means and remain in the separate piston cylinders



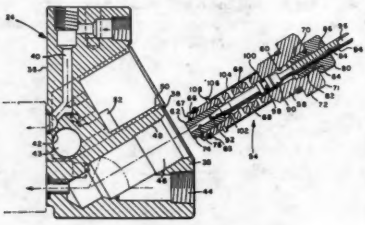
when the assembly is detached from the main body element.

4,598,841

THERMOPLASTIC DISPENSING GUN HAVING A SELF-CONTAINED FILTER AND FLOW CONTROL VALVE

Harry Smiles, Sandy Springs, Ga., assignor to Nordson Corporation, Amherst, Ohio

Filed Jul. 12, 1983, Ser. No. 512,969
Int. Cl.[4] B67D 5/62
U.S. Cl. 222—146.5 **2 Claims**



1. A modular apparatus for extruding a molten thermopolastic material from a pressurized source, the apparatus comprising:

a service block module defining a first passage for the molten thermoplatic material, said service block module including front and rear surfaces;

a removable gun module attachable to the front surface of said service block module;

said service block module further defining a second passage acutely disposed with respect to said first passage, said second passage opening at the rear surface, said first and second passages intersecting with each other;

a heating means contained within said service block module;

a filter positioned within said second passage so as to communicate with incoming molten material; and

a flow control assembly positioned within said second passage so as to communicate with incoming molten material, said flow flow control assembly including;

an elongated body with a central bore and a plurality of ports communicating with said bore,

a valve seat positioned within said bore, and

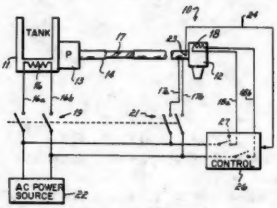
an adjustable needle valve movable between one position in which said needle valve seats against said valve seat ceasing the flow of molten material to said gun module and another position in which said needle valve is spaced apart from said valve seat a selected distance thereby allowing a selected flow of molten material to said gun module.

4,598,842

SEQUENCED HEATING FOR HOT MELT ADHESIVE DISPENSING SYSTEM

Charles K. Sticher, 3784 Whaley Ct., Snellville, Ga. 30278, and Charles H. Scholl, 3699 Hermitage Dr., Duluth, Ga. 30136

Filed Mar. 1, 1985, Ser. No. 707,090
Int. Cl.[4] B67D 5/62
U.S. Cl. 222—146.5 **8 Claims**



1. A hot melt adhesive dispensing system comprising a hot melt adhesive dispenser, a hot melt adhesive tank, means for coupling hot melt adhesive to the dispenser from the tank, a dispenser heater for heating hot melt adhesive in the dispenser, a tank heater for heating hot melt adhesive in the tank, a third heater for heating hot melt adhesive intermediate the tank and the dispenser, means for coupling the tank heater and the third heater to a source of power to energize the tank heater and the third heater, means for sensing the temperature at the tank, and means, responsive to said temperature sensing means, for coupling the dispenser heater to a source of power to energize the dispenser heater when said temperature sensing means senses a selected temperature at the tank.

6. The method of heating a hot melt adhesive dispensing system which includes a tank for hot melt adhesive coupled to a dispenser for hot melt adhesive comprising the steps of:

(a) heating the tank and heating hot melt adhesive intermediate the tank and the dispenser;

(b) sensing the temperature at the tank; and

(c) heating the dispenser when the temperature sensed at the tank reaches a selected level.

4,598,843

TAKE-UP PISTON SHIPPING LOCK FOR VISCOUS PRODUCT DISPENSERS

Donald D. Foster, Lee's Summit; Robert N. Hills, Raytown; David G. Moore, Lee's Summit, and Phil L. Nelson, Kansas City, all of Mo., assignors to Realex Corporation, Kansas City, Mo.

Filed Oct. 11, 1984, Ser. No. 659,677
Int. Cl.[4] B67D 5/32; G01F 11/00
U.S. Cl. 222—153 **1 Claim**

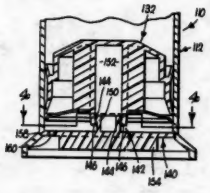
1. In a viscous product dispenser having a take-up piston at one end of a tubular body thereof which responds to the evacuation of product from the dispenser through an outlet by shifting of the piston in the body toward the opposite end thereof and decreasing the internal volume of the dispenser by an amount which corresponds to the volume of product discharged, the improvement comprising:

releasably interengageable locking means for preventing

shifting of the take-up piston toward the opposite end of the body unless the locking means is released,

said locking means including an abutment on the piston and a shoulder carried by the body disposed in blocking relationship to said abutment, said shoulder being selectively movable to a position clearing said abutment whereby to release the piston,

said shoulder being rotatably mounted on said body for rotation relative thereto into said abutment-clearing position,



said shoulder comprising a portion of a locking stud on a circular cover plate for said one end of the body, said cover plate being retained by holding means on said body against travel with the piston during said shifting thereof but being rotatable relative to the holding means of the body and the piston into said abutment-clearing position, said piston having a socket therein receiving said stud of the cover plate, said abutment being disposed within said socket.

4,598,844

CONTAINER AND DISPENSER FOR MATERIAL IN GRANULAR OR POWDER FORM

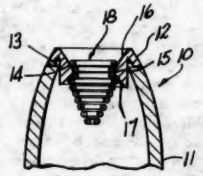
William Morris, 383 Wilsworth Ave., New Haven, Conn. 06511

Filed Aug. 27, 1984, Ser. No. 644,792

The portion of the term of this patent subsequent to May 15, 2001, has been disclaimed.

Int. Cl.⁴ A47G *19/24*

U.S. Cl. 222—196.2 **7 Claims**



1. A device for containing and dispensing material in granular or powder form comprising a container, means defining an outlet opening at an end of said container, a spring member of conical shape defined by a plurality of helices of decreasing diameter about a longitudinal axis, said member being affixed to said container in said opening and depending into said container, said spring member being formed of wire, a plurality of notches defined in said wire transverse of the length of said wire, the notches in one helix defining with an adjacent helix an annular array dispensing apertures in each helix.

4,598,845

DOSING APPARATUS FOR DISPENSING PREDETERMINED QUANTITIES PREFERABLY OF BEVERAGES FROM A BOTTLE

Nazmi Ozdemir, 25 Abelogade, 3 tv., 2100 Copenhagen O, Denmark

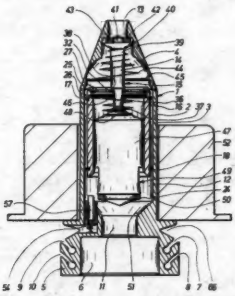
PCT No. PCT/DK83/00105, § 371 Date Jul. 10, 1984, § 102(e) Date Jul. 10, 1984, PCT Pub. No. WO84/01937, PCT Pub. Date May 24, 1984

PCT Filed Nov. 4, 1983, Ser. No. 629,540

Claims priority, application Denmark, Nov. 11, 1982, 5018/82; Apr. 5, 1983, 1504/83

Int. Cl.⁴ G01F *11/28*

U.S. Cl. 222—449 **5 Claims**



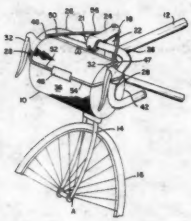
1. A dosing apparatus for dispensing predetermined quantities of liquid from a bottle or the like, said apparatus having an internal cavity corresponding to the predetermined dosage quantity, a front end provided with a liquid outlet opening and a rear end provided with a liquid inlet opening which is adapted to be fastened at the orifice of the bottle, said apparatus comprising: a first valve device for cooperating with the outlet opening to thereby control the flow of liquid through the outlet opening, said first valve device including a loose valve body shaped as a solid of revolution and located substantially coaxially within the internal cavity for movement between open and closed positions with respect to the outlet opening; a second valve device for cooperating with the inlet opening to thereby control the flow of liquid from the bottle through the inlet opening when the first valve device is open to flow of liquid through the outlet opening, said second valve device including a loose valve body shaped as a solid of revolution and located substantially coaxially within the internal cavity for movement between open and closed positions with respect to the inlet opening; and means for closing the second valve device before the first valve device is opened and for automatically opening the second valve device when the first valve device has been closed, said means including a magnetically activatable displacement body movable forwardly and rearwardly within the internal cavity in such a way that upon magnetic activation the displacement body moves in a direction to pull the first valve body away from its closed position substantially immediately after the second valve body has been brought to its closed position, the displacement body including an annular part substantially coaxially disposed around the first and second valve bodies and cooperating with such valve bodies by means of radially upwardly projecting parts which are formed by a separate annular connection member snapped into a circumferential recess in the inner surface of the annular part of the displacement body, the annular connection member having radial, inwardly extending branches connected with an inner annular abutment portion snapped into the first valve body; and an air valve for equalizing the pressure in the bottle during outflow of liquid.

4,598,846

HANDLEBAR BICYCLE BAG

Frederick R. Schroeder, 524 Duncan Ave., Alexandria, Va. 22301

Filed Feb. 15, 1985, Ser. No. 702,019
Int. Cl.[4] B62J 7/06
U.S. Cl. 224—36 8 Claims



1. An article carrier for releasably mounting to handlebars of a bicycle, the handlebars being mounted at a central location on the bicycle by a mounting stem, said handlebars defining first and second curved portions on either side of a central portion extending through said stem, said article carrier comprising:

a container for receiving articles having a front portion and a top portion when said article carrier is mounted between said handlebars;

an uninterrupted cord attached to said container for attaching said container to said handlebars, said cord being attached to said container at first, second and third locations to define first, second and third mounting loops, said first location being located on the front portion of the container such that said cord extends transversely across said front portion and between said handlebar curved portions when said article carrier is mounted to said handlebars, said second and third locations being located on said container adjacent the curved portions of said handlebars when said article carrier is mounted between said handlebars, said first and second loops being looped around the first and second curved portions of the handlebars, respectively, and said third loop passing over or under said central portion of said handlebars to engage said mounting stem; and

locking means for releasably securing opposing sections of said third loop to said mounting stem, said locking means being located on said cord opposite from said first location and in contact with said stem when said article carrier is mounted between said handlebars.

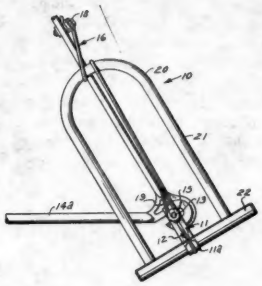
4,598,847

LOCK BRACKET FOR BICYCLES

John T. Ames, III, 12330 Tomanet Trail, Austin, Tex. 78758

Filed Feb. 16, 1984, Ser. No. 580,732
Int. Cl.[4] B62J 11/00
U.S. Cl. 224—39 1 Claim

1. A lock bracket for bicycles, comprising, in combination, a "J"-shaped plate member, a stiffening rib extending longitudinally along said member, one end of said member forming a straight shank while an opposite end forms a rounded hook, an opening in a terminal end of said shank for receiving a rear axle of a bicycle and being located between a wheel and an axle end nut thereof, and a length of shock cord having a loop formed at its one end, an annular groove around said nut, said cord loop being removably received around said nut groove while a longitudinally intermediate portion of said cord is wrapped around a "U"-end portion of a bicycle lock having a transverse tubular cross-bar at its opposite end portion removably seated



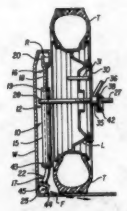
in said hook, and an opposite end of said cord is removably secured to a rear frame of said bicycle.

4,598,848

SPARE TIRE CARRIER

G. Keith Clark, Kannah Creek, Whitewater, Colo. 81527

Continuation of Ser. No. 638,932, Aug. 9, 1984, abandoned. This application Dec. 11, 1985, Ser. No. 807,129
Int. Cl.[4] B60R 9/02
U.S. Cl. 224—42.24 12 Claims



1. A spare tire carrier apparatus for pickup trucks wherein the trucks have a load bed floor and side walls with an upper rail, in which the spare tire carrier comprises a vehicle body engaging assembly and a spare tire clamping assembly, said vehicle body engaging assembly having upper and lower end portions and a generally hollow elongated central sleeve means having upper and lower portions, said elongated sleeve means having vertically extending generally planar side walls, said vehicle body engaging assembly being vertically adjustable by manual rotation of said elongated central sleeve means to cause at least one of said upper and lower end portions to be outwardly extended with respect to said elongated central sleeve means so that said upper end portion will engage the upper rail of the side wall of the pickup truck and said lower end portion will engage the load bed floor of the truck, said lower end portion of said vehicle body engaging assembly extending outwardly with respect to the axis of said generally hollow elongated central sleeve means, said spare tire clamping assembly including a tire mounting means, said tire mounting means having a first generally U-shaped end portion and a second end portion extending outwardly therefrom, said U-shaped end portion extending in generally abutting relationship with at least two generally opposing side walls of said elongated central sleeve means so as to prevent the rotation of said elongated central sleeve means within said U-shaped end portion, a clamping plate moveably disposed along said second end portion of said tire mounting means for selectively engaging a tire disposed about said tire mounting means, means for urging said clamping plate means toward said first end portion

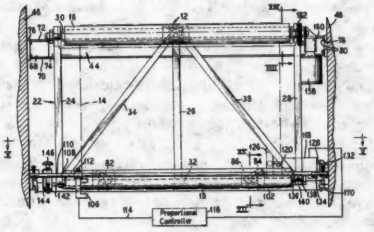
of said tire mounting means, said means for urging said clamping plate means being adjustable to move said clamping plate means against a tire carried by said tire mounting means while simultaneously urging said first generally U-shaped end portion of said tire mounting means into a pressured engagement with said elongated central sleeve means to thereby prevent any rotational manipulation of said elongated central sleeve means.

4,598,849

WEB GUIDING AND DECURLING APPARATUS

Kenneth G. Frye, Egremont, and Arthur T. Karis, Lenox, both of Mass., assignors to Beloit Corporation, Beloit, Wis.

Filed Mar. 23, 1984, Ser. No. 592,417
Int. Cl.[4] B65H *23/038, 23/04*
U.S. Cl. 226—21 12 Claims



1. A device for guiding webs of paper material to a high speed sheeter comprising:

a guide frame having a top horizontal roller over which the paper web passes and a bottom horizontal roller over which the paper web passes downstream of said top roller,

a pair of spaced stationary side walls,

a support bracket secured to said side walls,

said guide frame pivotally mounted on said support brackets to pivot in a substantially vertical plane,

means mounted between said walls downstream from and adjacent to said bottom roller for detecting the edge position of the paper web,

said detecting means producing an error signal when the web's edge deviates from a desired position,

means controlled by said error signal to cause said frame to pivot thereby moving said bottom roller to cause said web edge to return to the desired position,

means mounted on said frame downstream of said top roller and upstream of said bottom roller for decurling the paper web as it passes through said frame, and

means for sensing the tension of the paper web as it passes through said frame including a support bar,

roller means carried on said support bar for engaging said frame to restrain said frame against movement other than pivotal movement about said pin,

said support bar being pivotally mounted to said stationary walls to pivot in response to engagement force between said frame and said roller means, and

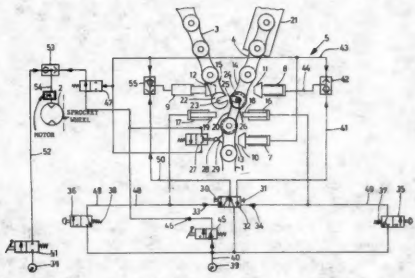
means for measuring pivotal movement of said support bar.

4,598,850

WEB THREADING ARRANGEMENT FOR THREADING A PAPER WEB THROUGH A ROTARY PRINTING MACHINE

Johann Winterholler, Friedberg; Josef Plantsch, and Petra Fischer, both of Augsburg, all of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Feb. 11, 1985, Ser. No. 700,503
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1984, 3405294
Int. Cl.[4] B65H *20/00*
U.S. Cl. 226—92 20 Claims



1. Web threading arrangement for threading a paper web through a rotary printing machine along a selected one of a plurality of parallel or shunt paths (B, C) having

a threading means (1, 3, 4);

path direction switches (5, 6) for guiding the threading means in a selected path in accordance with the setting of the switches, and

wherein, in accordance with the invention,

the threading means comprises

at least two separable elongated elements (1, 3, 4) having respective lengths to form an endless loop between the switches (5, 6), the lengths of the separable elements being matched to the length of the desired selected threading path;

selectively engageable and separable connection means (20, 21, 22, 23, 24, 25; 59) located at the end portions of the separable threading elements for selectively connecting selected elements together in accordance with the length of the selected path, and to provide an endless combined threading means whose length is matched to the selected path and a return path (A);

and a drive means (M, 2) in engagement with said thus-formed endless threading means.

4,598,851

FASTENER DRIVING TOOL

Rowland J. Kopf, Southington, Conn., assignor to Uniset Corporation, Indianapolis, Ind.

Division of Ser. No. 394,684, Jul. 2, 1982, Pat. No. 4,493,376.
This application Mar. 5, 1984, Ser. No. 586,139
Int. Cl.[4] B25C *1/08*
U.S. Cl. 227—9 2 Claims

1. A powder-actuated fastener tool comprising:

(a) a housing having a bore;

(b) a breech block reciprocally slidably mounted in said housing bore, said breech block having a bore;

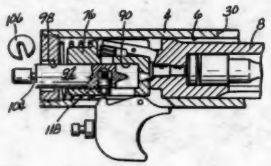
(c) a firing pin reciprocally slidably mounted in said breech block bore, said firing pin having a breechward elongated spring guide portion formed with an exterior circumferential groove;

(d) a C ring fitted onto said firing pin groove and extending

radially outwardly from said spring guide portion of said firing pin;

(e) ring means in said housing bore and having a through passage for reception of said spring guide portion of said firing pin and having a breechward counter bore forming a stop shoulder for engagement by said C ring to limit muzzleward movement of said firing pin;

(f) pawl means on said firing pin, said pawl means engaging a first surface on said breech block thereby limiting muzzleward movement of said breech block and said pawl means engaging a second surface on said breech block to cause said firing pin to move in a breechward direction



when said breech block is moved in a breechward direction in said housing bore;

(g) a member mounted on said housing and overlying said C ring and said spring guide portion of said firing pin;

(h) a firing pin spring engaging said member and said C ring to bias said C ring into said counter bore and to bias said firing pin toward a muzzleward fired position; and

(i) said C ring being removable from said counterbore and groove after removal of said member from said housing and subsequent breechward movement of said breech block and firing pin so that said breech block and firing pin may be moved muzzleward of the tool and removed from the remainder of the tool.

4,598,852

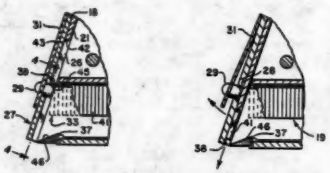
FASTENER DRIVING TOOL INCLUDING FASTENER DEFORMATION AND GUIDANCE ARRANGEMENTS

Paul Olesen, Bellmore, N.Y., assignor to Swingline Inc., Long Island City, N.Y.

Continuation-in-part of Ser. No. 372,911, Apr. 6, 1982, abandoned. This application Aug. 29, 1984, Ser. No. 645,471

Int. Cl.[4] B25C *1/06*

U.S. Cl. 227—119 **10 Claims**



7. A portable staple driving tool in which staples each having a crown and two legs and are driven along a staple driving raceway by reciprocating staple driver blade out an exit opening into a workpiece and in which each staple is fed from a staplestick into the raceway the improvement comprising

(a) positioning staplers in staplestick form with the staple crowns lying substantially in a plane on a magazine rail which rail has a front guide surface adjacent the raceway;

(b) staplestick feed means for feeding a staplestick along the raceway including a first-to-be driven staple;

(c) detent stud means protruding into the raceway and retractable from the raceway as the staple is driven; and

(d) a recess in the staple driver blade end for striking the staple against the stud means to deform the staple including its crown to toe in a leg as the staple is removed from the staplestick by the blade end.

4,598,853

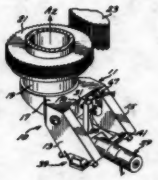
OPEN-CENTER FLEXURAL PIVOT WIRE BONDING HEAD

William H. Hill, Carlsbad, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 21, 1984, Ser. No. 612,293

Int. Cl.[4] B23K *37/02*

U.S. Cl. 228—4.5 **7 Claims**



1. A bonding head for a wire bonding machine comprising:

a support bracket having first and second bracket arms,

means for supporting a bonding transducer with a bonding tool, said supporting means having first and second outwardly extending arms;

first resilient means for resiliently deforming and having a center portion attached to said first outwardly extending arm and leaf springs extending from said center portion, said leaf springs being attached to said first bracket arm; and

second resilient means for resiliently deforming and having a center portion attached to said second outwardly extending arm and leaf springs extending from said center portion, said leaf springs being attached to said second bracket arm, said first and second resilient means cooperatively providing for said transducer supporting means a pivot axis displaced from said center portions attached to said transducer supporting means.

4,598,854

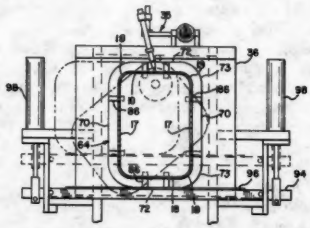
APPARATUS FOR SEALING NON-CYLINDRICAL TANKS

Eric Franke, Glen Ellyn; Robert Kerber, Park Ridge, and Marion D. Langley, Romeoville, all of Ill., assignors to Briskin Manufacturing Company, Chicago, Ill.

Filed Apr. 16, 1984, Ser. No. 600,401

Int. Cl.[4] B23K *37/04*

U.S. Cl. 228—48 **12 Claims**



1. A machine for rotating a vessel having a non-cylindrical cross-sectional form past a fixed point comprising:

opposed co-axially rotatable gripper means for gripping the opposite ends of said vessel therebetween;

an endless track carried on each of said gripper means and

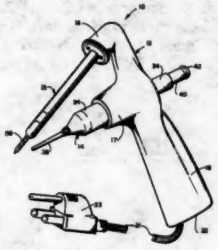
describing a path geometrically similar to the configuration of said vessel form;
actuator means rotatable about a fixed axis for engaging and moving said track; and
motor means for rotating said actuator means whereby the peripheral surfaces of said vessel pass said fixed point at a constant speed and a fixed distance from the axis of rotation of said acutator means,
said gripper means comprising a pair of opposed gripper assemblies and means for moving one of said assemblies away from and toward the other for admitting and gripping a vessel therebetween,
each of said gripper assemblies having a configuration geometrically similar to said vessel form, said track being secured to said assembly in concentric relationship therewith,
said actuator means comprising a sprocket wheel associated with each of said tracks and said endless track comprising a cooperating sprocket chain,
said gripper assembly being vertically suspended from said sprocket wheel with said chain in engagement with said sprocket wheel.

4,598,855

ONE-HANDED SOLDERING GUN

Richard S. Bell, 1310 Grayrock Dr., Marietta, Ga. 30066, and Charles T. Hood, Jr., 4038 Carter Dr., Lilburn, Ga. 30247

Filed Aug. 10, 1982, Ser. No. 406,770
Int. Cl.[4] B23K *3/02, 3/06*
U.S. Cl. 228—52 **6 Claims**



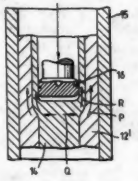
5. A soldering apparatus, comprising:
a body unit;
a solder retention unit supported by said body unit, said solder retention unit comprising an inner compartment including a paste chamber, said solder retention unit being movable relative to said body unit from a solder non-discharge position to a solder discharge position;
a solder exit port defined in said solder retention unit in communication between said paste chamber and the environment;
solder paste held within said paste chamber;
paste discharging means for forcing paste from said paste chamber in controllable amounts through said exit port;
means for arresting the flow of paste from said paste chamber through said exit port; and
solder melting means mounted to said body unit for melting solder discharged from said solder exit port.

4,598,856

PROCESS FOR MAKING BIMETALLIC SEAMLESS TUBING OF STEEL OR SPECIAL ALLOYS FOR EXTRUSION

Jesus M. Bilbao-Eguiguren, Av. Savino Arana No. 17, Bilbao, and Jose I. Garin de Lazcano, Carretera Yecora s/n., Oyon (Alava), both of Spain

Division of Ser. No. 456,899, Jan. 10, 1983, abandoned. This application Dec. 18, 1984, Ser. No. 683,141
Claims priority, application Spain, Jan. 14, 1982, 508733
Int. Cl.[4] B21C *23/22*
U.S. Cl. 228—131 **5 Claims**



1. A method of making a compound metallic cylindrical body comprising the steps of:
providing a steel billet having a square exterior cross-section and an axial circular cross-sectioned bore therein;
filling the entirety of said axial bore with a corrosion-resistant alloy to form a filled steel billet;
placing said filled steel billet into a cylindrical cavity defining the interior of a press;
applying radially inwardly directed pressure against the entire exterior surface of said filled steel billet within said cylindrical cavity to reform the square cross-section of said filled steel billet into a circular exterior cross-section;
subjecting the filled bore of the filled steel billet having a cylindrical exterior cross-section to rising hot piercing using a piercing tool having a diameter which is larger, smaller or equal to the diameter of said filled bore to form said compound metallic cylindrical body.

4,598,857

METHOD OF PRODUCING DOUBLE-WALL COMPOSITE PIPES

Shigetomo Matsui, Higashiosaka, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed Apr. 2, 1984, Ser. No. 595,837
Int. Cl.[4] B23K *31/00, 31/06;* B23P *11/02*
U.S. Cl. 228—132 **12 Claims**

1. A method of producing a double-wall composite metal pipe, comprising the steps of:
(a) preparing a pipe assembly made up of an outer pipe and an inner pipe inserted in the outer pipe with an annular clearance therebetween;
(b) causing the pipe assembly to advance relative to a plastic working means;
(c) heating the outer pipe in a zone progressively moving along the length thereof as the pipe assembly is caused to advance toward the plastic working means, to raise the temperature of the outer pipe higher than that of the inner pipe, thereby to increase said annular clearance in said moving zone;
(d) introducing a cooling medium into the inner pipe of the pipe assembly to cool the inner pipe without radial expansion thereof so as to increase the temperature difference between the inner and outer pipes;
(e) constricting the heated portion of the outer pipe by means of said plastic working means to plastically contract said heated portion against the outer surface of the inner pipe as the pipe assembly is caused to advance through the plastic working means; and
(f) cooling the contracted portion of the outer pipe after it

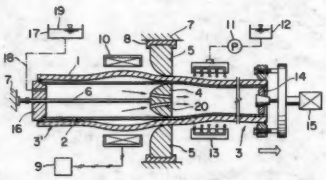
has passed through the plastic working means, to cause the outer pipe to shrink so as to firmly bind the inner pipe thereby to obtain an interference fit between the inner and outer pipes.

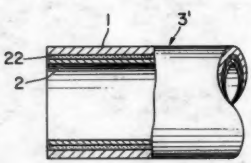
9. A method of producing a double-wall composite metal pipe, comprising the steps of:

(a) preparing a pipe assembly made up of an outer pipe and an inner pipe inserted in the outer pipe, and interposing a brazing material between the inner and outer pipes of the pipe assembly, and maintaining an annular clearance between the inner and outer pipes;

(b) causing the pipe assembly to advance relative to a plastic working means;

(c) heating the outer pipe in a zone progressively moving along the length thereof as the pipe assembly is caused to advance toward the plastic working means, to raise the temperature of the outer pipe higher than that of the inner





pipe thereby to increase said annular clearance in said moving zone, carrying out the heating so as to raise the temperatures of the outer and inner pipes above the melting point of the brazing material, still maintaining a temperature difference between the outer and inner pipes;

(d) constricting the heated portion of the outer pipe by means of said plastic working means to plastically contract said heated portion against the outer surface of the inner pipe as the pipe assembly is caused to advance through the plastic working means and producting a metallurgical joint between the opposing surfaces of the pipes of the composite metal pipe; and

(e) cooling the contracted portion of the outer pipe after it has passed through the plastic working means, to cause the outer pipe to shrink so as to firmly bind the inner pipe thereby to obtain a tighter fit between the inner and outer pipes.

4,598,858

COVERING MEANS AND METHOD FOR PROTECTING THE SURFACE OF A SOLDERING BATH

Tomas Stratil, Steinhausen; Milos Pisinger, Zurich, and Peter Fehr, Zug, all of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland

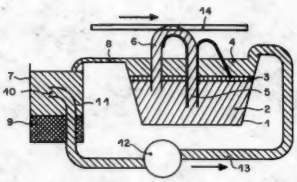
PCT No. PCT/CH84/00111, § 371 Date Mar. 12, 1985, § 102(e) Date Mar. 12, 1985, PCT Pub. No. WO85/00542, PCT Pub. Date Feb. 14, 1985

PCT Filed Jul. 11, 1984, Ser. No. 717,241

Claims priority, application Switzerland, Jul. 15, 1983, 3898/83

Int. Cl.⁴ H05K *3/34;* B23K *1/08*

U.S. Cl. 228—180.1 **10 Claims**



1. A method for protecting the surface of a soldering bath and for removing metal oxides during mechanical soft soldering of heavy metals, characterized in that a covering means is provided which comprises two phases (3,4), one placed above the other on the soldering both, which are liquid at the soldering temperature, and that the bottom phase (3) has a higher specific gravity than the top phase, the top phase serving to protect said surface from oxidation, the bottom phase including a chemically active component which is able to bind metal oxides in the soldering bath.

4,598,859

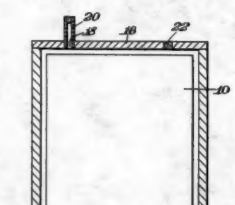
EXHAUSTING GAS FROM A METAL ASSEMBLY

Peter Cajthaml, Jr., Wilmington, N.C., and James R. Hunter, McMurray, Pa., assignors to Pfizer Inc., New York, N.Y.

Filed Feb. 8, 1985, Ser. No. 699,767

Int. Cl.⁴ B23K *31/02*

U.S. Cl. 228—185 **15 Claims**



1. A method for bonding dissimilar metals which comprises sealing an assembly of at least a pair of superimposed plates of dissimilar metals from the outside atmosphere;

evacuating the air and any other gases from between the plates of dissimilar metals;

sealing off the evacuated assembly to prevent access of gases to said plates;

heating the sealed assembly;

venting the heated assembly through a vent by melting of a metal or metal alloy closing off said vent during evacuation; and

hot rolling the vented assembly.

4,598,860

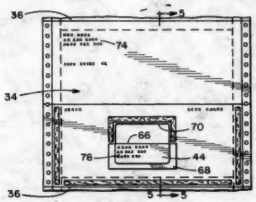
FLIP DIE CUT LABEL FOR FOLDED MAILER

Thomas G. Pennock, North Tonawanda, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Continuation of Ser. No. 539,129, Oct. 5, 1983, abandoned. This application Apr. 9, 1985, Ser. No. 721,497

Int. Cl.[4] B65D *27/10*; B41J *13/24*

U.S. Cl. 229—69 2 Claims



1. A continuous business form assembly comprising a continuous web having a continuous series of business forms and a series of attachment sheets thereon, the business forms each having a label portion and a non-label, remainder portion, the web having a first side and an opposite, second side, the label portion having a label face defined on the web first side and a label back defined on the web second side, the remainder portion having a remainder face defined on the web second side and a remainder back defined on the web first side, the label face and remainder face thereby being defined on the opposite first and second sides of the web,

the label portions each being partially cut from the business forms and defining a label edge foldable along a fold line to a printing position in which the label face is exposed with the remainder face on the second side of the web, for simultaneous, second web side printing of the label face and the remainder face,

the label portions each also being foldable along the fold line, after printing, to a labelling position in which the label face is returned to exposure on the first side of the web, opposite the remainder face, and acts as a label for the business form,

the label portion having a label height from the fold line to a first portion of the label edge and a label width transverse to the label height,

each of the attachment sheets being attached to a label back of a label portion and being adapted to attach the label portion to the remainder portion in the labelling position of the label portion, the attachment sheet having a sheet height extending from the fold line beyond the label height and a sheet width greater than the label width, the attachment sheet thereby being adapted to attach the label portion to the remainder portion all along the label edge, to seal the label edge.

4,598,861

BIMETALLICALLY CONTROLLED STEAM TRAP

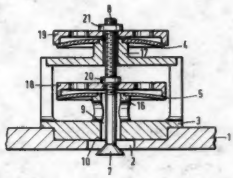
Werner Föller, Stuhr, Fed. Rep. of Germany, assignor to Gestra Kondensatableiter GmbH & Co., Bremen, Fed. Rep. of Germany

Division of Ser. No. 598,781, Apr. 10, 1984, Pat. No. 4,561,588. This application Aug. 1, 1985, Ser. No. 761,547

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1983, 33138885

Int. Cl.[4] F16T *1/04*

U.S. Cl. 236—59 4 Claims



1. In a steam trap having a closure valve disposed on the low pressure side cooperating with a valve seat, said valve being normally open at lower operating temperatures, a valve stem for said valve, a control unit disposed in the unit pressure side of said steam trap acting on said valve stem to close said valve at elevated temperatures, said control unit including a plurality of bimetallic spring elements in the form of bimetallic spring discs having an outer peripheral rim and an inner rim defined by a central aperture, the outer peripheral rim defining an operative portion of said bimetallic spring elements and the inner rim defining a support portion of said bimetallic spring elements, said bimetallic spring elements having different actuation temperatures, support means for supporting the support portions of said bimetallic spring elements in a stationary manner with respect to said steam trap, and means for engaging the operative portions of said bimetallic spring elements with the valve stem of said closure valve so that in a first partial range within the operating range of the steam trap, only one of the bimetallic spring elements is activated to exert a closing force on said closure valve, while in other partial ranges within the operating range of the steam trap at least another bimetallic spring element is activated to exert a closing force on said closure valve in addition to the closure force exerted by said bimetallic spring element activated in said first partial range, the improvement comprising:

(a) said bimetallic spring elements being bimetallic snap elements having mutually different snap temperatures;

(b) said support means for supporting the support portions of said bimetallic snap elements includes a support element fixed with respect to said steam trap for each bimetallic snap element;

(c) said means for engaging the operative portions of said bimetallic snap elements with the valve stem of said closure valve includes a support on the valve stem of said closure valve for each bimetallic snap element; and

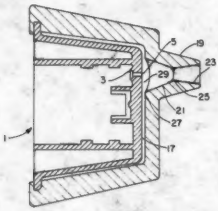
(d) means for adjusting each support engaging the operative portions of said bimetallic snap elements; each support element for the support portions of said bimetallic snap elements and each support for the operative portions of said bimetallic snap elements being so disposed with respect to one another that the closure valve closes on said valve seat within the closure stroke of each bimetallic snap element at the latest at the maximum of the spring force isotherms of the bimetallic snap elements.

4,598,862

FOAM GENERATING DEVICE AND PROCESS

Charles A. Rice, Greenville, S.C., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 31, 1983, Ser. No. 499,294
Int. Cl.[4] B05B 7/10, 7/30
U.S. Cl. 239—8 7 Claims



1. A foam generating apparatus, comprising:
means defining a swirl chamber;
a partition defining an orifice in communication with said swirl chamber;
means defining a venturi opening in communication with said orifice; and
wherein said means defining a venturi opening is spaced from said partition so as to provide an area of substantially circumferential gaseous communication to liquid sprayed through said orifice and into said venturi opening; and
wherein the travel distance for the sprayed liquid through said area of substantially circumferential gaseous communication and through said means defining a venturi opening is one-third (⅓) of an inch or less whereby liquid passes through said swirl chamber and said orifice to emerge therefrom as a fine mist spray and to entrain gas within said area of substantially circumferential gaseous communication both from venturi action and cyclonic action to emerge from said means defining a venturi opening as a foam within said less than one-third (⅓) inch distance of travel.

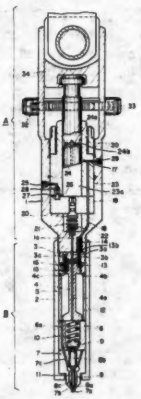
4,598,863

FUEL INJECTOR

Hiroshi Kanesaka, Kawasaki, Japan, assignor to Usui Kokusai Sangyo Kabushiki Kaisha, Sunto and Kabushiki Kaisha Kanesaka Gijutsu Kenkyusho, Kawasaki, both of, Japan

Filed Jan. 16, 1984, Ser. No. 570,911
Claims priority, application Japan, Jan. 20, 1983, 58-6705; Apr. 25, 1983, 58-71543; May 20, 1983, 58-87688
Int. Cl.[4] F02M 41/16
U.S. Cl. 239—96 1 Claim

1. A fuel injector for use with a compression ignition engine and a source of fuel, said fuel injector comprising:
a pump in connection with said source of fuel for urging fuel from said source toward said engine, said pump comprising a spill port for producing a reduction in the pressure produced by said pump;
a suction return valve in communication with said pump and comprising spring means for urging said suction return valve into a closed position in response to the reduction in pressure produced by said spill port;
an injection port in communication with said engine;
injection valve means movably mounted adjacent said injection port for alternately opening and closing the injection port;
biasing means for urging the injection valve means into position for closing the injection port;
a first fuel passage in communication with said suction return valve and with said injection valve means such that fuel in said first fuel passage urges the injection valve means into position for closing the injection port and such that the pressure of fuel in said first fuel passage is reduced in reponse to the closing of the suction return valve;
a second fuel passage in communication with said first fuel passage;
an accumulating chamber in communication with said second fuel passage and with said injection valve means such that fuel in said accumulating chamber urges said injection valve means into position for opening the injection port; and
an injection end control valve in said second fuel passage and being movable to alternately permit or block the flow of fuel through the second fuel passage, said injection end control valve including spring means for urging said injection end control valve toward an opened position, said injection end control valve being operative only in response to forces of said spring means and to pressure of



the fuel and being substantially free of direct mechanical interaction with other moving members of the fuel injector and the engine so as to close when the pressure of fuel in the accumulating chamber reaches a pre-determined level and to open when the pressure of fuel in the accumulating chamber falls below said pre-determined level, whereby when the pressure of fuel in the first fuel passage drops in response to the closing of the suction return valve, the fuel from said accumulating chamber opens the injection valve means to inject the fuel into the engine, and whereby when the pressure of fuel in the accumulating chamber falls below said pre-determined level, the injection end control valve opens allowing fuel from said accumulating chamber to flow to said first fuel passage and abruptly terminate the injection of fuel into the engine.

4,598,864

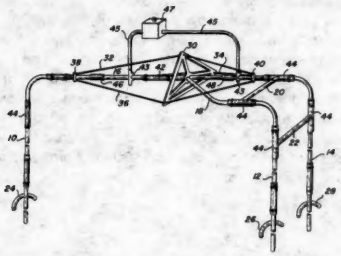
HIGH CROP OVERHEAD SPRAYER FRAME

Philip A. Jarinko, Lansdale; Frans Schuitemaker, Sellersville, and Paul W. Bishop, Telford, all of Pa., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 28, 1981, Ser. No. 229,283
Int. Cl.[4] B05R 9/08
U.S. Cl. 239—152 10 Claims

1. A high crop overhead sprayer frame comprised of, in combination, at least three vertically disposed leg members, at least one linear horizontal boom member connecting the tops of first and second vertically disposed leg members; a second horizontal member having a portion thereof parallel to, and in the same plane as said linear horizontal boom member and having one end connected to said horizontal boom member at a point disposed between said first and second vertically disposed leg members and the other end connected to a third

vertically disposed leg member, said third vertically disposed leg member connected to said first vertically disposed leg member by horizontal supporting members disposed at right



angles to said horizontal boom member, and each of said vertically disposed leg members having support means for lifting and carrying said frame and means for attaching a plurality of spraying nozzles to said frame.

4,598,865

SPRAYER CAP STRUCTURE

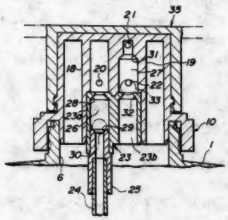
Masami Hamaguchi, Ohsaka; Toshio Taguchi, Yokohama; Takamitsu Nozawa, and Riichi Ogawa, both of Tokyo, all of Japan, assignors to Sisaido Co., Ltd. and Yoshino Kogyosho Co., Ltd., both of Tokyo, Japan

Filed Oct. 10, 1984, Ser. No. 659,299

Claims priority, application Japan, Oct. 24, 1983, 58-164463[U]; Dec. 5, 1983, 58-187597[U]; Mar. 1, 1984, 59-30072[U]

Int. Cl.[4] B05B *7/30;* **A62C** *31/00;* **B65D** *1/32, 37/00*

U.S. Cl. 239—342 **23 Claims**



1. A sprayer cap structure associated with a neck portion of a soft synthetic resin bottle-shaped container, said sprayer cap structure comprising:

an inner plug having a top wall and a cylindrical section integrally formed with adjacent first and second hollow cylindrical portions; said cylindrical section being perforated with a first hole communicating with said first cylindrical portion and with the bottom of the container through a pipe engaged with a lower end of the first cylindrical portion; said first cylindrical portion being formed with a first valve chamber provided with a blocking valve at an upper position of said first valve chamber, a first ball valve located within said first valve chamber, and a check valve at a lower position of said first valve chamber; said cylindrical section being perforated with a second hole and a third hole communicating with said second cylindrical portion and spaced longitudinally therefrom, said second cylindrical portion being formed with a second valve chamber under the second hole, said second valve chamber being provided with a blocking valve and a second ball valve at an upper position of the second valve chamber;

a nozzle unit formed with a top wall and an inner cylindrical section rotatably and non-telescopically associated with the inner plug; said inner cylindrical section having a spinner slot selectively communicating with the first and second holes of the inner plug, a first nozzle hole substantially at the center of the spinner slot of the inner cylindrical section, and a second nozzle hole capable of communicating with the third hole of the inner plug adjacent to the first nozzle hole; and

a cylindrical cover unit having a lower end immovably associated with the container body, said cover unit sheathing the inner cylindrical section of the nozzle unit, and formed with a window hole for exposing the first and second nozzle holes of the nozzle unit;

wherein the peripheries of the first, second and third holes on the outer peripheral wall of the inner plug are intimately contacted with the inner peripheral surface of the inner cylindrical section of the nozzle unit.

4,598,866

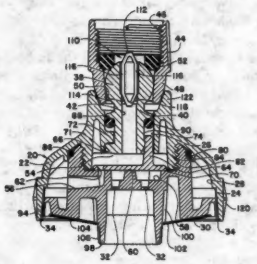
SHOWERHEAD

Michael A. Cammack, Laporte, and David W. Smith, Fort Collins, both of Colo., assignors to Teledyne Industries, Inc., Fort Collins, Colo.

Division of Ser. No. 459,137, Jan. 19, 1983, Pat. No. 4,561,593. This application May 6, 1985, Ser. No. 730,832

Int. Cl.[4] B05B *1/12*

U.S. Cl. 239—447 **3 Claims**



1. A showerhead comprising:

a generally hollow housing having front and rear openings leading to the interior of said housing;

means for securing said rear opening adjustably to a fixed position with respect to a liquid delivery pipe while allowing rotation of said housing around said securing means;

a closure affixed within said front opening and defining first and second groups of flow outlets from said interior for said liquid;

first and second channels defined in said closure for enabling flow of said liquid to respective different ones of said groups;

and a separate flow director located within said housing and fixed to said securing means against rotation relative to said securing means, said flow director selectively determining said flow as between respective ones of said groups in response to rotation of said housing around said securing means and said flow director.

4,598,867

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

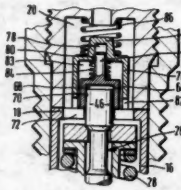
Dietrich Trachte, Leonberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 11, 1984, Ser. No. 659,913

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1984, 3405161

Int. Cl.[4] B05B *1/32;* F02M *61/00*

U.S. Cl. 239—453 7 Claims



1. A fuel injection nozzle for internal combustion engines, having a housing, a valve needle (26), which is loaded by a valve needle closing spring (28) and urged in an opening direction during an opening stroke by fuel pressure, wherein an opening movement is effected in a direction of the flow path of a fuel flow, and further having a damping device (46, 64, 70 or 46, 88, 90), which in partial-load and full-load operation damps an end stroke (h_2''), leading to a fully open position of said valve needle (26) in accordance with a number of strokes and/or stroke length or a fuel quantity throughput per injection event and said damping device includes a first cap (64 or 88) seated upon a front end (46) of the valve needle (26) that encounters an oncoming fuel flow, said first cap is pressed by a restoring spring (84 or 102) against said front end of said valve needle (26) and with said front end encloses a fuel-filled work chamber (68 or 92), in which said work chamber communicates with a flow path (20) of the fuel only via a throttled passage (70 or 90) between said first cap and said front end and said first cap comes to rest at a beginning of the damped end stroke (h_2) on a stop (18) integral with the housing, subsequent to which the fuel can pass only via said throttle passage (70 or 90) alongside the end of the valve needle (26) during displacement of said valve needle, thereby enlarging the work chamber (68 or 92), wherein a damping effect is variable by shifting a timing of an onset of damping with respect to an injection onset, said valve needle (26) is coupled with a second damping device (66, 74, 80 or 88, 94, 96), which in partial-load and full-load operation also at least intermittently damps an initial stroke (h_1), leading out of a closing position, of the valve needle (26) and a fuel-filled second work chamber (78 or 98) communicating with the flow path (20) via a second throttled passage (80 or 96), in which said second work chamber is formed between a second piston (66 or 88) and a second cap (74 or 94) mounted upon said second piston wherein said second piston (66 or 88) is associated with said first cap (64 or 88), and said second cap (74 or 94) is associated with a restoring spring (86 or 104), and said stop (18 or 106) integral with the housing.

4,598,868

FERTILIZER SPREADER HAVING DISPERSING SPACE FORMED BETWEEN FRONT END OUTLET AND A CLASH PART

Yoshitaka Asaoka, Towada; Takeo Higuchi, Aomori, and Yoshiharu Kuji, Towada, all of Japan, assignors to Sasaki Nouki Kabushiki Kaisha, Aomori, Japan

Filed Oct. 12, 1984, Ser. No. 660,498

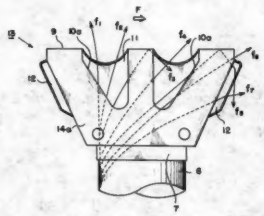
Int. Cl.[4] A01C *15/00;* B05B *1/26*

U.S. Cl. 239—659 19 Claims

1. In a fertilizer spreader wherein a distributor pipe is reciprocatively swung for discharging of fertilizer through a front end outlet thereof, the improvements comprising a distributing device attached to the front end outlet of the distributor pipe comprising:

an upper part;

a bottom part including a forwardly upwardly inclined bottom portion, and a pair of inclined upwardly extending side plates at both opposite sides thereof, said side plates being connected to and extending upwardly from said bottom portion, said bottom portion being a substantially straight, upwardly inclined, plate-like portion having a width which gradually increases in a direction away from said front outlet end of said distributor pipe and toward a front clash part; and



said front clash part being spaced apart from said front end outlet of said distributor pipe in the direction of fertilizer discharge so as to form a fertilizer dispersing space therebetween, said front clash part interconnecting said upper and bottom parts, said front clash part including at least two spaced apart blocking portions opposite and blocking a part of said front end outlet of said distributor pipe and against which fertilizer impinges, and said front clash part having at least one opening between said at least two spaced apart blocking portions;

said dispersing space being defined by at least said front clash part, said upper part, and said upwardly inclined bottom portion and said side plates of said bottom part.

4,598,869

BOBBIN DISTRIBUTING DEVICE

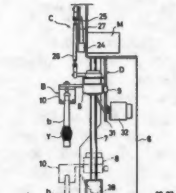
Hiroshi Uchida, Oumihachiman, and Tsukasa Kawarabashi, Kyoto, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Filed Oct. 7, 1983, Ser. No. 540,008

Claims priority, application Japan, Oct. 12, 1982, 57-155035[U]; Jul. 19, 1983, 58-131528

Int. Cl.[4] B65H *67/06*

U.S. Cl. 242—35.5 A 14 Claims



1. A bobbin distributing device comprising:

sensing means for discriminating between an empty bobbin and a bobbin having a first predermined quantity of yarn

wound on a bobbin and for providing a signal indicative of the quantity of yarn wound on a bobbin;

bobbin chucking means for chucking one end of said bobbin and moving with a bobbin in response to a signal from said sensing means;

guide means having a plurality of different guide faces for guiding the movement of said chucking means on said guide faces; and

switching means carried on the respective leading ends of said guide faces for receiving a signal from the switching means and switching and guiding said chucking means on one of said guide faces in response to a signal from said sensing means.

4,598,870

DEVICE FOR THE POWDER-DUSTING OF MOVING OBJECTS, PARTICULARLY FLAT SUBSTRATES

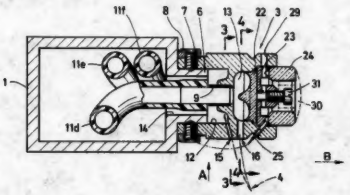
Gerhard Schloz, Leinfelden-Echterdingen, Fed. Rep. of Germany, assignor to Weitmann & Konrad GmbH & Co. KG, Fed. Rep. of Germany

Filed Aug. 21, 1984, Ser. No. 642,783

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1983, 3330665

Int. Cl.[4] B05B 5/02

U.S. Cl. 239—696 **9 Claims**



1. Device for the powder-dusting of moving objects, particularly flat substrates in the form of webs and sheets of paper, plastic, or textile, comprising a nozzle housing made of electrically-insulating material, a first chamber in said housing being connected by first conduit means to a compressed-air source means, a second chamber in said housing being connected by second conduit means to a powder-air-stream source means, a first nozzle on said housing connecting the first chamber to atmosphere and directed toward the substrate such that a first stream of compressed air flows through the first nozzle to atmosphere with a first velocity, a second nozzle on said housing connecting the second chamber to atmosphere and directed toward the substrate such that a second stream containing said mixture of powder and compressed air flows through the second nozzle to atmosphere with a second velocity, the second velocity being lower than the first velocity, the first nozzle being directed, relative to the second nozzle, in such a manner that said first stream unites with said second stream at a location spaced from the housing with the result that a combined powder/compressed air stream strikes the object to be powder-dusted, the device further comprising at least one electrode and a counter-electrode disposed on the outside of said housing on opposite sides of said second nozzle, a high voltage AC source connected to said electrode and counter electrode to create an AC field extending between said electrode and counter-electrode, said electrical AC field penetrating said second stream flowing out from said second nozzle and containing said dusting powder, at a location prior to the uniting of the first and second streams whereby a substantially neutral net charge is imparted to the lower velocity powder stream prior to its combination with the higher velocity compressed-air stream.

4,598,871

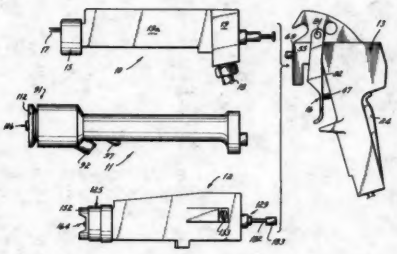
MULTIPLE PROCESS ELECTROSTATIC SPRAY GUN HAVING INTEGRAL POWER SUPPLY

Ronald J. Hartle, Lorain, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed May 10, 1984, Ser. No. 608,882

Int. Cl.[4] B05B 5/02

U.S. Cl. 239—706 **4 Claims**



3. An electrostatic spray gun comprising:

a handle section, a trigger pivotally mounted upon said handle section,

a booster power supply contained solely in said handle section, said booster power supply being operable to convert low voltage electrical energy supplied to said handle section of said gun into high voltage electrical energy,

a first barrel section, a flow control valve in said first barrel section, said first barrel section including an electrode mounted thereon, said first barrel section including means for removably securing said first barrel section to said handle section, said first barrel section having first connector means for electrically connecting said electrode of said first barrel section to said booster power supply, and second connector means for connecting said flow control valve to said trigger of said handle section, said first barrel section further including means for attaching said first barrel section to a source of air and to a source of liquid so as to enable said gun to spray an electrostatically charged, air atomized liquid therefrom,

a second barrel section, a flow control valve in said second barrel section, said second barrel section including an electrode mounted thereon, said second barrel section including means for removably securing said second barrel section to said handle section, said second barrel section including first connector means for electrically connecting said electrode of said second barrel section to said booster power supply, and second connector means for connecting said flow control valve of said second barrel section to said trigger of said handle section, said second barrel section further including means for attaching said second barrel section to a source of high pressure liquid so as to enable said gun to spray an electrostatically charged, airless atomized liquid therefrom, and

said first barrel section and second barrel sections being selectively and alternatively attachable to said handle section to enable said gun to alternatively spray air atomized liquid coating material and airless atomized liquid coating material, respectively.

4,598,872

METHOD OF OPERATING GRINDING APPARATUS AND GRINDING APPARATUS OPERATING ACCORDING TO THIS METHOD

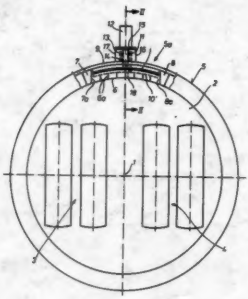
Heinrich Henne, Ennigerloh; Ludger Lohnherr, Oelde; Peter Rittscher, and Walter Holz, both of Beckum, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed May 6, 1985, Ser. No. 730,934

Claims priority, application Fed. Rep. of Germany, May 16, 1984, 3418196

Int. Cl.[4] B02C *15/00, 25/00*

U.S. Cl. 241—19 16 Claims



1. In a method of grinding wherein material to be ground is delivered to a ring mill having a circular grinding plate which rotates about a vertical axis and cooperates with grinding elements, a stationary nozzle ring on the outer periphery of the grinding plate, a sifter above the mill, a blower for delivering a gas stream through the nozzle ring into said mill and the sifter at a speed to entrain relatively fine constituents of ground material discharged over the periphery of the grinding plate and carry them upwards towards the sifter, a power driven conveyor for receiving the relatively coarse constituents of the ground material discharged over the periphery of the grinding plate and conveying such constituents upwards for return to said ring mill, and wherein the quantity of the hot gas stream passing through the mill and the sifter is kept substantially constant by a first control circuit, the improvement comprising sensing the consumption of power by said conveyor, altering the gas speed in the nozzle ring in response to a change in the consumption of power by said conveyor in a manner to maintain the quantity of material and the gradation of grain sizes thereof conveyed by said conveyor substantially constant, sensing the speed of gas passing through said nozzle ring, and reducing and increasing the delivery of material to said mill in response to a predetermined increase and decrease, respectively, of the speed of the gas passing through said nozzle ring.

4,598,873

METHOD OF MANUFACTURING A PUMPABLE COAL/LIQUID MIXTURE

Jorgen Cleemann, Copenhagen, Denmark, assignor to F. L. Smidth & Co. A/S, Denmark

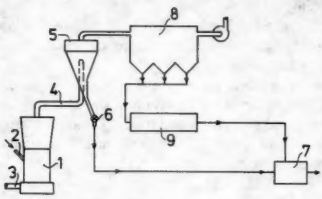
Filed Jun. 1, 1983, Ser. No. 499,855

Claims priority, application United Kingdom, Jun. 14, 1982, 8217170

Int. Cl.[4] B02C *19/12*

U.S. Cl. 241—21 4 Claims

1. A method of manufacturing a pumpable coal/liquid mixture, said method comprising the steps of dry-grinding said coal to a relatively coarse particle size in a first grinding stage, separating said dry-ground coal into a coarser fraction and a finer fraction, thereafter dry-grinding said finer fraction in a tube mill, said tube mill having grinding bodies having an average weight of not more than 5 grams, to a relatively fine particle size thereby forming a fine-ground fraction, and thereafter mixing said fine-ground fraction and said coarser fraction remaining, without further grinding, from said first grinding



stage together with a liquid so as to form a pumpable slurry consisting essentially of said fine-ground fraction, said coarser fraction and said liquid.

4,598,874

SIFTING DEVICE

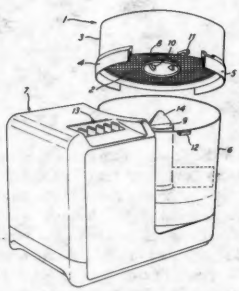
Edward C. W. Barnett, Hayling Island, England, assignor to Thorn EMI Domestic Appliances Limited, London, England

Filed Dec. 5, 1983, Ser. No. 558,358

Claims priority, application United Kingdom, Dec. 9, 1982, 8235130

Int. Cl.[4] B02C *1/00, 25/00*

U.S. Cl. 241—37.5 6 Claims



1. A food processor comprising:

a housing,

an electric motor accommodated in said housing,

a bowl, having a rim, for retaining foodstuff ingredients,

support means supporting said bowl relative to said housing,

a drive member, adapted to be driven for rotation by said motor, upstanding from said support means and extending into said bowl, and

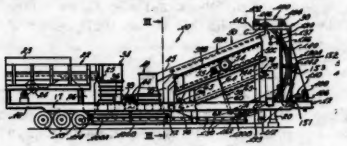
a sifting device removably attached to the rim of said bowl, said sifting device comprising a base portion, a mesh of flexible material in said base portion, a periphery of said base portion conforming to the rim of said bowl, an upstanding wall connected to said base portion and extending around said periphery, downwardly-extending protrusions removably attaching said base portion to said rim, an open-based member defining an inner surface, said member being connected to said mesh and located over said drive member, and spaced protuberances on said inner surface adapted to engage intermittently with said drive member during rotation thereof to impart undulatory movement to said mesh, whereby an ingredient of granular or powdery consistency placed in said device, is encouraged to pass through said mesh into said bowl.

4,598,875

PORTABLE CRUSHING AND SCREENING PLANT

Larry D. Bronson, and Egbert Couperus, both of Belleville, Canada, assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation of Ser. No. 122,457, Feb. 19, 1980, abandoned, which is a continuation of Ser. No. 941,084, Sep. 11, 1978, abandoned. This application Mar. 9, 1981, Ser. No. 241,577
Int. Cl.[4] B02C *21/02, 23/12*
U.S. Cl. 241—78 7 Claims



1. In a mobile material crushing and screening plant having an elongated frame and wheels mounted on and in supporting relation to the frame, the combination comprising:

a first screening device, a primary crusher, a secondary crusher and a second screening device mounted on said frame in longitudinal sequence in the order recited,

an endless belt conveyor on said frame having a main endless belt with a working run having a longitudinal extending portion extending horizontally in the elongated direction of said frame beneath said screening devices and crushers, said working run having a curved segment curving upwardly in an arc from beneath said second screening device, thence adjacent the receiving end of said second screening device, said receiving end being more remote from a selected end of said frame than the discharge end of said second screening device, said curved segment of said working run of said endless belt terminating above said receiving end of said second screening device, said conveyor including an endless cover belt having a working run cooperatively engaging said curved segment of said working run of said main endless belt,

said first screening device being operable to separate the material deposited thereon into fines and oversize material and to feed the oversize material to said primary crusher and the fines to said working run of said main endless belt disposed therebelow,

said primary crusher being operable to crush said oversize material and discharge its output onto said working run of said main endless belt,

said secondary crusher discharging its output onto said working run of said main endless belt,

said belt conveyor being operable to convey the material received from said first screening device, said primary crusher and said secondary crusher and discharge it directly onto said receiving end of said second screening device,

said second screening device being operable to separate material delivered thereto by said belt conveyor into oversized material which it delivers directly to said secondary crusher and fines which do not require additional crushing which it delivers to discharge means,

said secondary crusher receiving exclusively said oversize material from said second screening device and discharging its output onto said working run of said main endless belt and

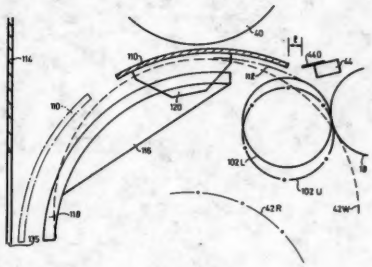
a generally upright support structure for supporting a major portion of said curved segment of said working run of said main belt, said support structure having a lower section secured to said frame and an upper section pivoted on a transverse axis at its lower end to the upper end of said lower section, said upper section being swingable from an upright operating position downwardly about said transverse axis to a lowered transport position.

4,598,876

WINDING MACHINE FOR FILAMENT PACKAGES EQUIPPED WITH PACKAGE SCREENING MEANS

Kurt Schefer, Winterthur, Switzerland, assignor to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Mar. 1, 1985, Ser. No. 707,425
Int. Cl.[4] B65H *54/02, 67/044*
U.S. Cl. 242—18 A 11 Claims



1. A winding machine for thread, especially for synthetic plastic filament, comprising:

a friction drive member having a longitudinal axis and rotatable about said longitudinal axis thereof;

a first chuck having a longitudinal axis and movable along a first predetermined path from an idle position thereof to a winding position thereof in which said first chuck is driven into rotation about said longitudinal axis thereof by said friction drive member;

said first chuck being returnable to said idle position thereof by movement along said first predetermined path;

a second chuck having a longitudinal axis and movable along a second predetermined path from an idle position thereof to a winding position thereof in which said second chuck is driven into rotation about said longitudinal axis thereof by said friction drive member;

said second chuck being returnable to said idle position thereof by movement along said second path;

said first path being disposed above said second path; and

screening means movable from a retracted position thereof into an operative screening position thereof between said idle position of said first chuck and said winding position of said second chuck for at least preventing a thread tail of said thread wound on said first chuck from acceding to a region near said winding position of said second chuck.

4,598,877

APPARATUS FOR WINDING WEB MATERIAL ON A TUBULAR CORE

Hannu Oinonen, Järvenpää, Finland, assignor to Oy Wartsila AB, Finland

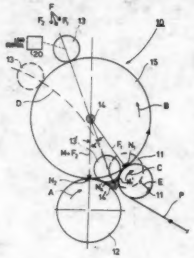
Filed Apr. 9, 1985, Ser. No. 721,398
Claims priority, application Finland, Apr. 11, 1984, 841448
Int. Cl.[4] B65H *18/20*
U.S. Cl. 242—66 9 Claims

1. In apparatus for winding a tensioned web material, such as a paper web, on a tubular core to obtain a web roll wound on said tubular core, the apparatus including a first carrier roll forming a first nip with the web roll, a second carrier roll forming a second nip with the web roll, a weight roll acting on the web roll with a press force, and wherein at least one of said first and second carrier rolls is a driven roll for rotating said tubular core and the web roll wound thereon, the improvement comprising:

load control means for pressing said weight roll against said web roll to apply a press force thereon, the magnitude of the press force being selectively variable;

said first carrier roll being positioned such that a nip pressure acting in said first nip formed between said first carrier roll and said web roll is determined by the magnitude of the component of the press force applied on said web roll by said weight roll, said nip pressure in said first nip being variable from substantially zero to a mixmum;

said second carrier roll being positioned such that said first and second carrier and weight rolls are arranged asymmetrically with respect to each other with the weight of the web roll



acting on said second nip formed between said web roll and said second carrier roll;

said web material is disposed to run onto the core tube through a space between said first and second carrier rolls and through said first nip; and

wherein the tension of the web material being wound is determined solely by the magnitude of the component of the press force applied on said web roll by said weight roll which acts on said first nip formed between said web roll and said first carrier roll.

4,598,878

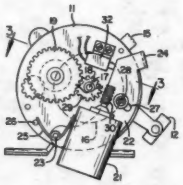
MOTORIZED FISHING REEL

Walter J. Steffan, P.O. Box 116, Tygh Valley, Oreg. 97063

Filed Mar. 5, 1984, Ser. No. 586,310

Int. Cl.[4] A01K *89/017*

U.S. Cl. 242—84.1 A **1 Claim**



1. A motorized fishing reel comprising

a reel body with opposite ends,

a spool shaft journaled on said reel body,

a fish line spool mounted on said shaft,

drive receiving gears on said shaft disposed at one end of said reel body,

drive output gears disposed on said one end of said reel body,

electric motor means having an electric circuit therefor operably connected to said drive output gears,

a microswitch in the circuit of said electric motor means,

a switch actuating lever movably mounted on said one end of said reel body in parallel relation along said one end,

said switch actuating lever having a first position which opens said microswitch to deenergize said motor means and a second position which closes said microswitch to energize said motor means,

said drive output gears and said electric motor means being supported on said switch actuating lever and being disengaged from said drive receiving gears in the first position of said switch actuating lever and engaged with said drive receiving gears in the second position of said switch actuating lever,

said microswitch and switch actuating lever being dimensioned and arranged such that the gears of said drive output gears and said drive receiving gears are engaged prior to closing of said microswitch in the movement of said switch actuating lever from its first to second positions,

and a finger actuating tab on said lever for manually moving said lever between its first and second positions.

4,598,879

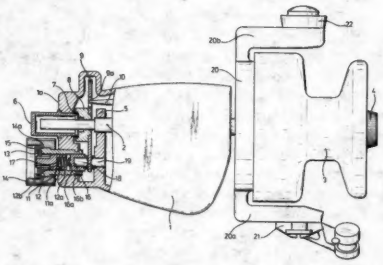
DRAG MECHANISM FOR A SPINNING REEL

Chikara Fujigiwa, Naganoke, and Minoru Sasabe, Naganoken, both of Japan, assignors to Matsuo Kogyo Co., Ltd., Naganaten, Japan

Continuation of Ser. No. 148,278, May 9, 1980, abandoned. This application Aug. 27, 1982, Ser. No. 412,379

Int. Cl.[4] A01K *89/02*

U.S. Cl. 242—84.5 R **2 Claims**



1. A spinning reel having a drag mechanism adapted thereto comprising in combination:

a reel shaft having mounted thereon a reel proper having first and second ends with a click nail fixed to said second end of said reel proper and a spool member mounted on said reel shaft on said first end of said reel proper;

a collar means fitted about said reel shaft on said second end of said reel proper so as to rotate with said reel shaft;

a single braking disk mounted on said collar means and provided with a series of holes at equal distances about the periphery of said disk such that said holes are engaged by said click nail whereby said disk rotates with said reel shaft;

means for coupling said disk with said spool member so that said spool member reciprocates relative to but rotates with said disk, and

a braking mechanism positioned parallel to said reel shaft beneath said collar means, said braking mechanism comprising in working relationship a cylinder attached to said second side of said reel proper threaded on an inner wall thereof with a short unthreaded portion of a side of said cylinder facing said disk for receiving a holding element having a recess therein facing said disk, an axially movable element threaded on the outer surface thereof for engaging said threaded portion of said cylinder, said movable element having a recess on the disk side thereof for receiving a coil spring interpositioned between said axially movable element and said holding element capable of pressuring said holding element toward said disk, a brake shoe tightly inserted into the recess of said holding element for engaging said disk at the outer extremity thereof in response to pressure from said coil spring and a freely rotatable adjusting knob fitted to said cylinder whereby pres-

sure force applied on said coil spring by said adjustable knob causes said axially movable element to move back and forth.

4,598,880

PERFORATED CORE FOR A TEXTILE YARN PACKAGE

Jean-Pierre Brutel, Ecully; Yvon Leray, Loriol-S/Drome, and Louis Quey, Lyons, all of France, assignors to Rhone-Poulenc Fibres, Lyons, France

Continuation of Ser. No. 627,477, Jul. 3, 1984, abandoned. This application Nov. 8, 1985, Ser. No. 795,730
Claims priority, application France, Jul. 4, 1983, 83 11215
Int. Cl.[4] B65H *75/18, 75/20, 75/10*
U.S. Cl. 242—164 11 Claims

1. A rigid cylindrical hollow perforated core for receiving the windings of a yarn package and for subsequent uniform dyeing of said yarns in said package and delivery of the dyed yarn package to the end user, said core comprising

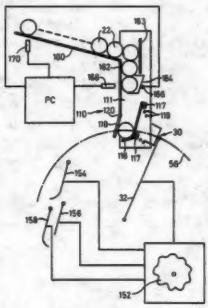
(A) a hollow cylindrical rigid body having an interior surface and an exterior cylindrical peripheral surface, a circumferential groove in the peripheral surface at one end of said body for winding reserve yarn, said groove having a plurality of perforations extending from the interior surface to the groove, said perforations having a maximum diameter of 2 millimeters, a portion at the opposite end of said body being sized for nestingly interengaging, in fluid tight interengagement, with the circumferentially grooved end of an adjacent core, and a central portion extending between said circumferential groove and said nesting portion, said central portion including a plurality of tapered orifices perforating said body and divergingly tapering from the interior surface to the external cylindrical peripheral surface to permit dyeing of the yarn package by flowing a dye solution through the hollow body, said orifices being distributed over the central portion such that the ratio of the diameter of the core before and after dyeing a yarn package which has been wound to a density of from 0.4 to 0.55 and which weight from between 2.5 to 4.5 kilograms is at most 1.25, the peripheral surface of said central portion being corrugated to facilitate the attachment to the core of the first several layers of yarn windings.

4,598,881

BOBBIN INSERTING DEVICE

André Lattion, Seuzach, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed May 18, 1984, Ser. No. 611,710
Claims priority, application United Kingdom, May 20, 1983, 8313994
Int. Cl.[4] B65H *54/26, 67/04*
U.S. Cl. 242—35.5 A 11 Claims



1. In a yarn handling machine, the combination comprising

a bobbin gripper movable along a first fixed path of movement for selectively gripping bobbins of varying diameter, said gripper including a plurality of adjustably mounted bobbin engaging elements for gripping a selected bobbin;

a bobbin holder for presenting a selected bobbin to said gripper at a predetermined bobbin collection location on said path, said holder including an adjustable element selectively mounted in each of a plurality of positions corresponding to bobbins of varying diameter to receive a bobbin of a diameter corresponding to said selected position with an axis of each received bobbin of varying diameter located on said path, and a retainer element for retaining a received bobbin on said adjustable element;

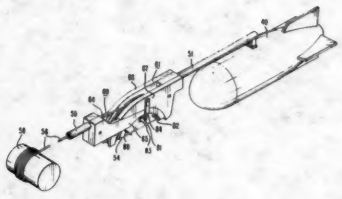
a cradle mechanism having a pair of parallel arms movable along a second path of movement to receive a bobbin between said arms from said gripper at a predetermined transfer location common to said paths and to move the bobbin to a yarn winding position.

4,598,882

LOW PROFILE DEPLOYMENT/RETRIEVAL SYSTEM

Everett W. Opdahl, Lutherville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 21, 1984, Ser. No. 612,277
Int. Cl.[4] G64D *3/00*
U.S. Cl. 244—1 TD 7 Claims



1. A deployment/retrieval system for a tethered body comprising:

(A) first and second hollow arm members;

(B) a slip boundary sheave having the general outline of a segment of a circle, the body of said sheave having a

peripheral channel extending around the circumference thereof between side wall portions;

(C) endless track means within said channel and movable relative to said body, said track means including means for receiving a cable;

(D) said first and second arm members being constructed and arranged so as to be in cooperative rotatable engagement with said body of said slip boundary sheave;

(E) each said arm member including a respective forked fitting at an end thereof, each forked fitting including two arcuate segments straddling said slip boundary sheave;

(F) said slip boundary sheave including on either side thereof a plurality of arcuate concentric grooves;

(G) each said arcuate segment of said forked fittings including an arcuate projection which mates with a respective one of said arcuate grooves of said slip boundary sheave to allow for said rotatable engagement;

(H) winchable cable means extending through said first arm member, over a portion of said endless track means and through said second arm member; and

(I) a tethered body connected to the end of said cable means.

4,598,883

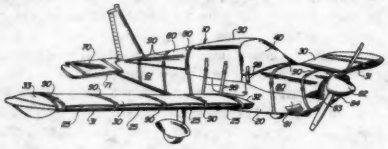
APPARATUS FOR PROTECTING A PORTION OF THE EXTERIOR OF AN AIRCRAFT

William L. Suter, 2618 - 15th Ave., Moline, Ill. 61265

Filed Feb. 10, 1984, Ser. No. 578,961

Int. Cl.[4] B64D *47/00*

U.S. Cl. 244—1 R **11 Claims**



1. Apparatus for protecting the exterior of an aircraft comprising:

a plurality of selectively interconnectable elastomeric foam members, each substantially in the form of a sheet covering a substantial portion of the exterior of said aircraft; and

strap means for removably attaching said foam members to their respective portions of the exterior of said aircraft; said strap means encircling said foam members and compressing a portion of said sheets, creating air spaces between said sheets and said exterior of said aircraft, said air spaces being disposed between adjacent strap means for preventing moisture accumulation between said sheet and said exterior of said aircraft.

4,598,884

INFRARED TARGET SENSOR AND SYSTEM

Spencer J. Speer, Ontario, Calif., assignor to General Dynamics Pomona Division, Pomona, Calif.

Filed Nov. 28, 1984, Ser. No. 676,021

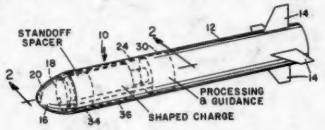
Int. Cl.[4] F41G *7/26*; F42B *13/10*

U.S. Cl. 244—3.16 **14 Claims**

1. An infrared (IR) target sensor for mounting in an IR transmissive nose cone of a missile, said sensor comprising:

a primary mirror mounted in the base of a nose cone for receiving IR radiation from a target and for focusing the IR radiation on a secondary mirror;

said secondary mirror being mounted in the nose of said nose cone for receiving the IR radiation from said primary mirror, and for focusing the IR radiation on a plurality of IR transmissive elements; and



said plurality of IR transmissive elements being positioned around the periphery of said primary mirror for receiving the IR radiation from said secondary mirror.

4,598,885

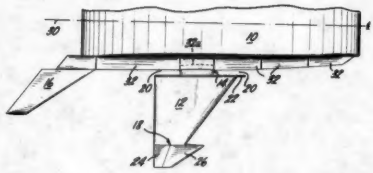
AIRPLANE AIRFRAME

Simon V. Waitzman, 57 Montague St., Brooklyn Heights, N.Y. 11201

Filed Mar. 5, 1979, Ser. No. 17,684

Int. Cl.[4] B64C *1/26, 3/54, 3/58, 39/10*

U.S. Cl. 244—13 **72 Claims**



1. An airplane airframe designed for high subsonic, transonic or supersonic speeds comprising:

(a) a fuselage structure;

(b) wings, each having a leading edge, a trailing edge, an inboard end and an outboard end and being connected to said fuselage structure at said inboard end;

(c) spars intervening between said fuselage structure and said inboard ends of said wings, each such spar having an airfoil configuration, the maximum height of which is substantially less than the maximum height of the wing at or about the inboard end thereof, only one such spar being associated with each of said wings, each such spar forming the only connection between said fuselage structure and the associated wing, each such spar remaining exposed during high speed horizontal flight, and

(d) wing fences at about the inboard ends of said wings, said wing fences extending from the upper and lower surfaces of said wings over the entire forward to rearward extent thereof.

4,598,886

DOUBLE PARASOL, FAVORABLE INTERFERENCE AIRPLANE

Gottfried O. Friebel, Bellevue, and Robert M. Kulfan, Kirkland, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 13, 1979, Ser. No. 65,792

Int. Cl.[4] B64C *3/10*; B64D *27/18, 29/02*

U.S. Cl. 244—15 **5 Claims**

1. An aircraft capable of extended cruiseat high Mach numbers through utilization of favorable aerodynamic interference effects by mutual interaction of flow fields comprising:

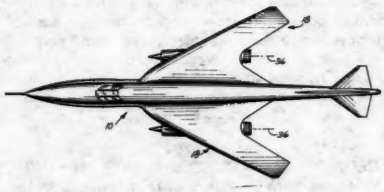
a fuselage, area-ruled to optimize favorable interference effects and having a longitudinal center line defining a plane of symmetry;

a wing attached to said fuselage on opposite sides of said

plane of symmetry, each wing having a lateral curvature extending from root to tip;

a jet power plant nacelle having an axial center line and a length substantially equal to the length of the local wing chord being suspended beneath each said wing;

each said wing forming a substantially parabolic lower reflection surface means for reflecting and redirecting portions of a shock wave pressure field generated by each



said nacelle at supersonic speeds to produce lift, each reflection surface means comprises a parabolically curved inboard portion adjacent said root, a substantially planar central portion and a parabolically curved outboard portion adjacent said tip, the respective nacelle center line being located at the focus of each parabolically curved portion to maximize the shock wave pressure field generated by each nacelle.

4,598,887

ROTARY WING FLYING CRAFT

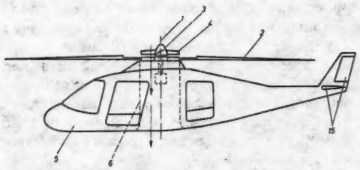
Heinz Jordan, Wölfnitz bei Klagenfurt, Austria, assignor to Technische Gerate-u.Entwicklungsgesellschaft m.b.H., Klagenfurt, Austria

Continuation of Ser. No. 524,459, Aug. 18, 1983, abandoned. This application Sep. 4, 1985, Ser. No. 773,091

Claims priority, application Austria, Aug. 24, 1982, 3195/82; Jun. 24, 1983, 2323/83

Int. Cl.[4] B64C *27/12*

U.S. Cl. 244—17.11 **19 Claims**



1. A rotary wing flying craft comprising at least two rotor blades around an essentially vertical axis when in a horizontal flight attitude and at least one driving means for driving the rotor blades and a cabin means for receiving load, wherein in flowing direction of the air stream generated by the driving means, an air channel is formed in the cabin means and penetrates the same with the inlet opening of the air channel provided on the top side of the cabin means and the outlet opening of the air channel provided on the bottom side of the cabin means so that the entire air stream generated by said driving means flows through the air channel from top to bottom, and wherein two spatially superposed guide vane systems are provided in the air channel, one of these guide vane systems being formed as a guide vane ring loosely rotatably supported in relation to the driving means on which ring the rotor blades are mounted, while the other guide vane system is provided in order to compensate the counter torque, said other guide vane system being mounted in a wall of said air channel at one end and on a supporting structure for said driving means at the other end, and in said air channel at least two steering fins pivotally supported around axes which are perpendicular in relation to the essentially vertical axis of the air channel are provided, said steering fins being mounted in said wall of said air channel.

4,598,888

FIXED-WING AIRCRAFT WITH TANDEM SUPPORTING SURFACES

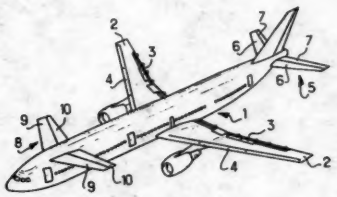
Roger H. Béteille, Blagnac, France, assignor to Airbus Industrie, France

Continuation-in-part of Ser. No. 144,357, Apr. 28, 1980, abandoned. This application Jun. 15, 1984, Ser. No. 621,261

Claims priority, application France, Jan. 9, 1980, 80 00443

Int. Cl.[4] B64C *13/16*

U.S. Cl. 244—76 R **7 Claims**



1. A fixed-wing large transport aircraft having a fuselage with a nose and a tail spaced therefrom, said fuselage having a center of gravity, said aircraft comprising tandem supporting surfaces including monoplane main wings secured to the fuselage in an intermediate area thereof, each of the main wings having at least one lift-increasing flap and at least one leading edge slat; a horizontal tail surface with at least one stabilizer plane at the tail of said fuselage, said stabilizer plane having a variable angular position which is selectively adjustable through controlled adjustment; a third supporting surface mounted on said fuselage in tandem relation with the other supporting surfaces and including a canard airfoil affixed to said fuselage at the nose thereof in front of the center of gravity thereof, said canard airfoil extending from opposite sides of said fuselage and consisting of a canard plane and a movable trailing edge control surface; means for monitoring the instant position of said stabilizer plane of said horizontal tail surface; a control system for measuring parameters representative of the drag of the aircraft such as the fuel flow and thrust of said aircraft; and wherein the trailing edge control surface of said canard airfoil is controllable in accordance with the position of one of said lift-increasing flap and said leading edge slat thereby producing a positive aerodynamic balance at said horizontal tail surface for the given flight conditions of the aircraft, said control system is adapted to deflect said canard airfoil in accordance with the measured parameters and the horizontal tail surface correspondingly so as to allow the aircraft to fly always with an optimal incidence angle for all three lifting surfaces.

4,598,889

HINGE ARRANGEMENT FOR MODEL AIRCRAFT

Richard C. Remington, P.O. Box 314, Pompton Plains, N.J. 07444

Filed Aug. 1, 1984, Ser. No. 636,692

Int. Cl.[4] B64C *9/02*

U.S. Cl. 244—87 **1 Claim**

1. In a model aircraft, the combination of a fixed structure of the aircraft having a number of first hinge members attached thereto with a controlled surface of the aircraft having a number of second hinge members attached thereto, wherein one of said first hinge members is adapted to operatively engage one of said second hinge members, each of said first hinge members provided with a lateral keyhole slot formed with a substantially cylindrical lateral aperture, each of said second hinge members having a lateral barbell portion removably engaging

said lateral keyhole slot of an operatively associated first hinge member, whereby a predetermined displacement of each of said operatively associated lateral keyhole slots retains each of said lateral barbell portions within each of said operatively associated substantially cylindrical lateral apertures, thereby providing a rotating hinge action for said controlled surface relative to said fixed structure, each of said hinge members provided with relatively large mounting surfaces for attaching said members without structural alterations to said fixed struc-

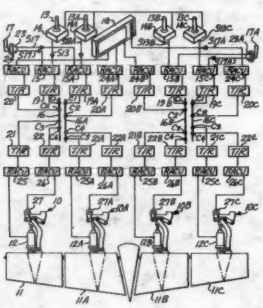
ture and to said controlled surface, filler block means provided on said controlled surface between adjacent second hinge members substantially eliminating any gap between the controlled surface and the fixed structure of the aircraft, each of said hinge members fabricated from a plastic material to eliminate radio noise problems in radio controlled model aircraft and to facilitate cementing with instant glue onto said fixed structure and said controlled surface, and control means attached to said controlled surface limiting its arcuate movement to prevent separation of said first and second hinge means.

4,598,890

AVIONIC CONTROL SYSTEM

Hans K. Herzog, Bellevue, and Seiya Sakurai, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 1, 1983, Ser. No. 519,288
Int. Cl.[4] B64C *13/50*
U.S. Cl. 244—230 **4 Claims**



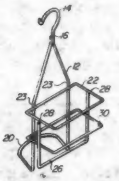
1. An avionic control system for aircraft, comprising: a flight control surface divided into multi-control segments and each control segment being independently mounted for angular motion about a hinge axis; and actuator separately connected to each individual control segment for angular movement thereof; a manually operable controller for generating a first signal related to direction and magnitude of displacement of said controller; means for tansmitting said first signal to each of said actuators for controlling angular movement of their respective control segment; a gain control power module separately interposed into the main load path between each actuator and its respective control segments means responsive to flight Mach number of the air craft for providing a second signal; means for transmitting said second signal to each of said gain control power modules for decreasing the angular displacement range of each respective control segment relative to its actuator movement as the Mach number of the aircraft increases; and means for transmitting a nulling signal to the gain control power module of a malfunctioning control segment for producing a zero angular displacement range of said control segment relative to its actuator movement and moving said control segment to a neutral non-deflected position regardless of its actuator movement.

4,598,891

CLOSET ROD RACKET AND BALL HOLDER

John A. Hanert, 1678 Central Ave., Deerfield, Ill. 60015

Filed Dec. 24, 1984, Ser. No. 685,444
Int. Cl.[4] A47F *7/00*
U.S. Cl. 248—340 **6 Claims**



1. A device for supporting a racket and balls and arranged for suspension from a closet rod or the like comprising:

a suspension member arranged to be suspended from one end thereof;

racket support means affixed to the other end and at one side of said suspension member for supporting a plurality of rackets; and

ball support means affixed to an opposite side of said suspension member and arranged with respect to said racket support means to provide balance about said suspension member when said device is supporting rackets and balls by their respective support means, whereby said rackets are maintained in a substantially vertical alignment; said racket support means comprises a substantially rigid loop projecting from said suspension member and forming an acute angle therewith.

4,598,892

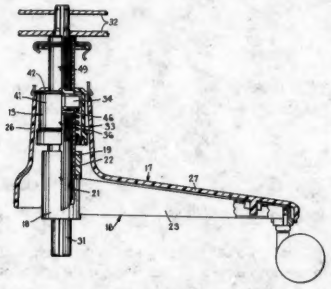
MECHANICAL CHAIR-HEIGHT CONTROL MECHANISM

Paul F. Franckowiak, Grand Haven, and Walter C. Mrotz, III, Comstock Park, both of Mich., assignors to Haworth, Inc., Holland, Mich.

Filed Jul. 27, 1984, Ser. No. 634,944
Int. Cl.[4] F16M *11/24;* A61G *15/00*
U.S. Cl. 248—406.2 **6 Claims**

1. In a chair having a seat means, a base assembly having an upwardly projecting pedestal defining a central opening which projects vertically downwardly thereof, a vertically elongated spindle which is at least partially externally threaded and has the upper end portion thereof nonrotatably connected to said seat means, the lower portion of said spindle being rotatably supported within the central opening of said pedestal, and a load-released height-adjusting mechanism coacting between said spindle and said pedestal for permitting the seat means and spindle to be vertically displaced a preselected distance between a raised position when the seat means is unoccupied and a lowered position when the seat means is occupied, said

height-adjusting mechanism permitting free rotation of the seat means when the latter is occupied and is in said lowered position, said height-adjusting mechanism permitting the height of said seat means to be vertically adjusted relative to the pedestal when the seat means is in said raised position and the unoccupied seat means is rotated relative to the pedestal, said height-adjusting mechanism including a nut threadably engaged with said spindle and sprinig-urged upwardly toward said raised position, said height-adjusting mechanism also including a clutch means for nonrotatably connecting the nut to the pedestal when in said raised position, the nut being disengaged from the clutch means when in said lowered position, the improvement wherein said clutch means comprises a one-piece clutch member having an annular clutch plate positioned above said nut in surrounding relationship to said spindle, said clutch means also including a sleevelike part which is concentrically fixed to said clutch plate and projects axially downwardly therefrom in surrounding relationship to said spindle, said sleevelike part concentrically surrounding said nut and projecting axially downwardly therefrom in concentric surrounding relationship to the upper end of said pedestal, and coupling means coacting between said sleevelike part and said pedestal for defining a bayonet-type connection therebetween for stationarily coupling said clutch member to said pedestal, said bayonet-type coupling means including a first plurality of locking flanges which are fixed to and project radially outwardly from said pedestal in circumferentially spaced relationship therearound so as to define recesses between circumferentially adjacent locking flanges, said coupling means also including a plurality of circumferentially spaced, radially inwardly projecting locking tabs formed on said sleevelike part adjacent the lower free end thereof, said locking tabs being angularly spaced apart by intermediate spaces, said sleevelike part also having annular shoulder means formed internally thereof and directed axially downwardly, said shoulder means being spaced directly axially above said locking tabs for defining a narrow groove therebetween in which to accommodate said locking flanges.



4,598,893

LOCKING DEVICE

Brian C. Stobbart, 62 Yangoora Crescent, Ashmore Village, Qld. 4215, Australia

PCT No. PCT/AU82/00010, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO82/02666, PCT Pub. Date Aug. 19, 1982

Continuation of Ser. No. 432,950, Sep. 30, 1982, abandoned. This PCT application Feb. 4, 1982, Ser. No. 783,280

Claims priority, application Australia, Feb. 4, 1981, PE7477; Jun. 17, 1981, PE9341

Int. Cl.[4] A62C *23/04*

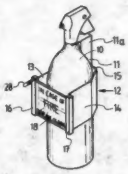
U.S. Cl. 248—548 **8 Claims**

8. Bracket means for preventing removal of an article from means supporting the article comprising:

a retaining assembly securable to the supporting means and engageable with or by the article to prevent removal thereof from the supporting means, said assembly including:

a retaining bracket formed of a flexible material and having a base portion adapted to be secured to the supporting means and spaced flanges extending away from said base portion and having free edges each comprising a channel portion;

link means including a frangible panel forceably dislodgeable or freely removable from said assembly to enable removal of the article from the supporting means, said channel portions being adapted to slidably receive respective edge portions of said frangible panel to retain the same;



said link means further including a catch assembly comprising a strip adapted to extend between said flanges and having opposite end projections adapted to engage in respective apertures formed in said channel portions to maintain the same engaged about said edge portions, said strip in use being held by said panel in operative engagement with said apertures; and

lock mounting means for reception of releasable locking means engageable with said panel and said bracket to lock said panel to said bracket to prevent free removal of said panel but being releasable to enable free removal of said panel from said bracket.

4,598,894

FASTENING SYSTEM FOR FASTENING A DEVICE WHICH HAS TWO SPACED HOLDING FLANGES

Haftmann Johannes, Delbrück-Ostenland, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Sep. 19, 1984, Ser. No. 652,360

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1983, 8326902[U]

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—615 **9 Claims**

1. A system providing means to secure a body to a receiving member, comprising, in combination:

a body having a depth D;

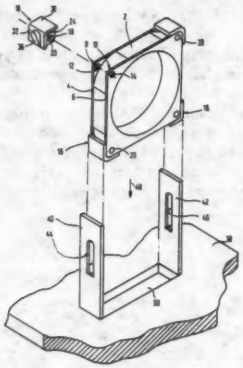
a pair of flat, rigid plates shaped to conform generally to said body and fixed abuttingly on opposite plane faces of said body, each plate having at least one corner section extending beyond an edge of said body in corresponding opposition to said corner section of the other plate of said pair, each corner section having an opening in corresponding opposition to said opening of said corner section of said other plate;

a fastening element comprising:

a main strip of depth D′ equal to depth D of said body plus the combined thickness of both of said pair of plates, with a biplanar configuration shaped to correspond to an associated corner section of said pair of plates;

a retaining brace, disposed within the included angle of said biplanar-configured main strip, having opposite faces and a dimension between said faces substantially equal to depth D of said body, and having on each face

a button disposed to fit within said openings of said corner sections upon association of said fastening ele-



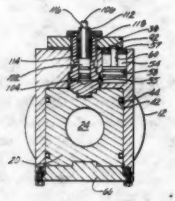
ment with said corner sections; and locking means disposed on an outside surface of said main strip; and a receiving member to secure the body to.

4,598,895

PLUG VALVE WITH HYDRAULICALLY ACTUATED SEALS

Carl O. DeWald, Thousand Oaks, and Jack H. Pollock, Gardena, both of Calif., assignors to Precision Technologies, San Francisco, Calif.

Filed Aug. 31, 1984, Ser. No. 646,099
Int. Cl.[4] F16K *31/44*
U.S. Cl. 251—78 **3 Claims**



1. A valve of the type having a body with an inlet and outlet duct, a plug rotatably disposed in the body and having a port for fluid communication between the ducts, such port at least partially registering with the ducts when the valve is at an open position and not registering with the ducts when the valve is at a closed position, pressurizable means for forming a seal between the body and plug, a closed fluid-filled hydraulic system including a reservoir containing a hydraulic fluid in communication with the seals and a pressure piston movably disposed in the reservoir and means for displacing the piston to apply a selected pressure to the hydraulic fluid for pressuring the seal means, the improvement comprising:

the valve includes a bore communicating with the reservoir and seals;

a regulator piston movably disposed in the bore;

means for resiliently urging the regulator piston against the hydraulic pressure in the reservoir with a preselected force, displacement of the pressure piston to pressurize the seal means displacing the regulator piston against the urging means to regulate the pressure of the hydraulic fluid; and

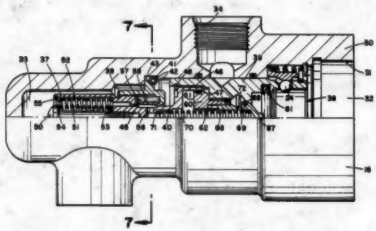
means for compensating for thermal expansion including a sleeve movably disposed in the reservoir, the sleeve movably mounting the pressure piston, the compensating means including means for biasing the sleeve against the hydraulic fluid with a force greater than the selected hydraulic fluid pressure, thermal expansion of the fluid displacing the sleeve against the biasing means to increase the volume of the hydraulic system to prevent over-pressurization of the hydraulic system.

4,598,896

QUICK DISCONNECT COUPLING

Ojars Maldavs, Lincoln, Nebr., assignor to Imperial Clevite Inc., Glenview, Ill.

Filed Aug. 16, 1985, Ser. No. 766,147
Int. Cl.[4] F16L *37/28*
U.S. Cl. 251—149.6 **11 Claims**



1. A female quick connect and disconnect coupling comprising:

an outer tubular housing having an internal bore and an open forward end adapted to receive a male coupling, a first port adapted to supply pressurized hydraulic fluid to the bore of the housing, and a second port adapted to relieve hydraulic fluid pressure in the bore of the housing;

a seal mounted within the bore of the housing;

a tubular valve body slidably mounted in the bore of the housing and having a port communicating with said first port in the outer housing;

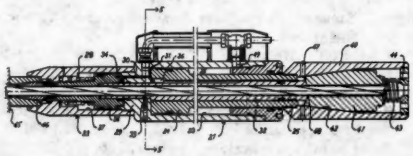
a tubular spool attached to the valve body and having a port therein, the spool being slidable relative to the seal to open and close the port in the spool whereby hydraulic fluid pressure in the valve body and the spool can be relieved when the spool is moved to open the port therein.

4,598,897

HYDRAULIC TENSIONING TOOL

Vilho Aikioniemi, Eskilstuna, Sweden, assignor to Aktiebolaget Bygg -och Transportekonomi (BT) Div. Nike Hydraulics, Eskilstuna, Sweden

Filed Feb. 11, 1985, Ser. No. 700,533
Claims priority, application Sweden, Feb. 16, 1984, 8400832
Int. Cl.[4] E21B *19/00*
U.S. Cl. 254—29 A **23 Claims**



1. An hydraulic tensioning tool for tensioning reinforcing cables, rods and like devices (13) in concrete structures, comprising:

a first working piston-cylinder device (21) including a cylin-

der (23) and a tensioning piston (24); and a cable holder (14) for creating tension; and

a second working piston-cylinder device (12) including a locking cylinder (27) and a locking piston (26); and a cable lock (12) for anchoring the cable subsequent to creating tension therein;

a cylinder housing (11) in which both of said piston-cylinder devices (21,12) are housed, said cylinder housing (11) being common to both of said piston-cylinder devices;

said piston (24,26) of said first and second piston-cylinder devices being movable in mutually opposite directions during their respective working strokes;

said tensioning piston (24) having a free end (25) projecting from said cylinder housing, and said cable holder (14) being mounted on said free projecting end (25); and

an electromechanical position indicator (16) arranged between said cylinder housing (11) and said cable holder (14);

said position indicator (16) including a coil assembly (17) for generating a magnetic flux, and a core (18) arranged for insertion into said coil assembly so as to influence the magnetic flux in relation to the relative movement between said cylinder housing (11) and said cable holder (14);

said cable holder (14) including an outer sleeve (40) having movable tensioning jaws (41) mounted therein; and

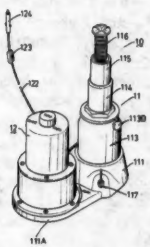
said outer sleeve (40) including a readily removable backpiece (44).

4,598,898

ELECTRICAL HYDRAULIC JACK

Wen-Cheng Hsu, 2, Alley 15, Lane 229, Kwang-Hua St.; Chin-Jia Wu, 225, Min-Chuan Rd., and Shuen-Liang Kuo, 31, Lane 7, Shan-Kuan Rd., all of Tainan City, Taiwan

Filed Feb. 8, 1984, Ser. No. 578,217
Int. Cl.[4] B66F 3/24
U.S. Cl. 254—93 H 1 Claim



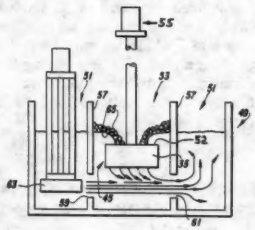
1. An improved electrical hydraulic jack having a base plate with a supporting seat and a hollow section formed thereon, a jack body provided with a piston assembly installed in the hollow section of the base plate, and a motor assembly having an external gear portion, a housing body having a fitting seat in a top portion thereof with a central opening formed therein and adapted to coupling with the motor assembly having said external gear portion extending into said housing body, a transmission coupled with the motor assembly for transmitting and reducing revolution speed of the motor assembly, driving means mechanically connected to said transmission and the piston assembly for converting revolving motion of said motor assembly into a straight-line movement, said driving means comprising a revolving gear having a plurality of openings rotatably disposed on a dead axle stud and meshed with a toothed stem of a second gear of the transmission, a driving pin having one end thereof installed in an opening of said revolving gear, an offset driven member having a sliding groove in one side, a middle cut-through opening, and a pair of orifices in an other side opposite said side having said sliding groove, said cut-through opening being disposed over said revolving gear with an other end of said driving pin movably positioned in the sliding groove of said driven member, and a free end of a piston rod of the piston assembly located in said cut-through opening, said driven member having first and second locating pins, said first locating pin connecting an end of the piston rod to said driven member in the cut-through opening through one orifice thereof, and a linking-up member having a pair of orifices formed therein and movably connected to a fixed stub through a third locating pin at one end and to said offset driven member through said second locating pin at an other end, whereby the revolving motion applied by the motor assembly will be converted into a straight line movement to effect hydraulic lift operation.

4,598,899

LIGHT GAUGE METAL SCRAP MELTING SYSTEM

Paul V. Cooper, Cleveland, Ohio, assignor to Kennecott Corporation, Cleveland, Ohio

Filed Jul. 10, 1984, Ser. No. 629,525
Int. Cl.[4] C22B 9/16
U.S. Cl. 266—212 13 Claims



1. A system for remelting light gauge scrap metals comprising:

a. remelting furnace means separated into at least one heating and at least one melting chamber;

b. heating means associated with and operable on each of said at least one heating chambers but separated from each of said at least one melting chambers;

c. port means located to enable the flow of molten metal between each of said at least one heating chambers and at least one of said at least one melting chambers and positioned to be below the surface level of molten metal within remelting furnace means;

d. molten metal pumping means operable to produce a flow of molten metal and positioned to direct said flow of molten metal from each of said at least one heating chambers into at least one of said at least one melting chambers and from each of said at least one melting chambers into at least one of said at least one heating chambers through said port means; and

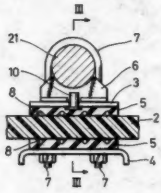
e. auger means, separate from said molten metal pumping means, located within each of said at least one melting chambers, positioned below and adjacent to said surface level to produce a gravity flow of said surface level of said molten metal thereto and downwardly therethrough, and operable to mechanically force light gauge scrap metals, which are located adjacent to said surface level of said molten metal, downwardly and substantially beneath said surface level of said molten metal concurrent with said gravity flow of said surface level of said molten metal.

4,598,900

FRP LEAF SPRING SUSPENSION

Masami Yamamoto; Kenichi Sekiyama, both of Toyota, and Kiyoaki Kuwayama, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jun. 25, 1984, Ser. No. 623,938
Int. Cl.[4] F16F *1/30*
U.S. Cl. 267—52 3 Claims



1. In a FRP leaf spring suspension for an automobile including a FRP leaf spring body having a surface surrounded tightly by a rubber pad and interposed between a retainer and a U bolt seat through said rubber pad at its longitudinal central portion, said surface being in frictional contact with said surrounding rubber pad and being fixed through a spring seat disposed on an upper side of said retainer to an axle housing by a U bolt passing through mating holes formed in said retainer and said U bolt seat, an improvement comprising a reinforcing fiber impregnated with resin and wound around said frictional contact surface of said FRP leaf spring body for increasing frictional force between said FRP leaf spring body and said rubber pad, and distributing the frictional force uniformly on said frictional contact surface between said FRP leaf spring body and said rubber pad.

4,598,901

SHINGLING AND STACKING OF CONVEYED SHEET MATERIAL WITH PRE-SHINGLING CONTROL OF SHEET FEED

Richard H. Thomas, Phillips, Wis., assignor to Marquip, Inc., Phillips, Wis.

Filed Oct. 24, 1984, Ser. No. 664,353
Int. Cl.[4] B65H *29/66*
U.S. Cl. 271—202 7 Claims

1. In the method of conveying sheets in succession from a first location along a plurality of separate in-line conveyors to a stacker wherein a stack of a predetermined number of sheets is to be formed, and wherein said sheets are first slowed and shingled into groups at a shingling location, the groups of shingled sheets are increased in speed, and the said conveyors are then individually slowed in a downstream direction, the step of: shingling the said sheets in multiple stages at said shingling location so that a multi-stage slowdown of said sheets occurs, said shingling step including:

(a) pre-shingling said sheets at a speed less than the speed of the sheets at said first location,

(b) and then re-shingling said pre-shingled sheets at a speed less than the speed of said pre-shingling,

(c) said pre-shingling step being performed at a fixed speed,

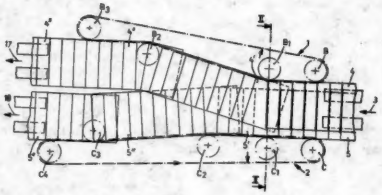
(d) and said re-shingling step being performed at a variable speed correlated to the fixed speed of said pre-shingling step.

4,598,902

APPARATUS FOR SEPARATING LATERALLY PROJECTING IMBRICATED PRINTED COPY PRODUCTS

Eckhard Schneider, Stadtbergen, and Walter Purkl, Augsburg, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Dec. 26, 1984, Ser. No. 686,209
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1984, 3400639
Int. Cl.[4] B65H *29/04*
U.S. Cl. 271—205 19 Claims



1. Apparatus for separating imbricated printed copy products (4, 5) having

a first arriving transport path (3) feeding said copy products in which outer imbricated copy products (5) are offset laterally from inner copy products (4) folded in the outer copy products (5), comprising

two pairs (1, 2) of upper (6, 8) and lower (7, 9) transport systems,

one pair each being located at the side of the transport path (3) and each pair engaging a respective side of the folded copy products and hence either an outer (5) or an inner (4) copy product;

each upper and lower transport system (6–7; 8–9) including an endless transport element and a plurality of engagement projection elements (10, 11, 12, 13) positioned on the respective upper and lower transport systems to project towards each other;

and guide means (14; 19, 20, 21, 22) guiding the respective pairs of transport elements in paths in which

(a) the pairs (1, 2) are essentially parallel to said transport path (3) and the upper and lower systems are positioned to leave an open clearance space between the projection elements (B; C, C1);

(b) the pairs (1, 2) of the transport systems continue in a path essentially parallel to said transport path (3) and the upper and lower systems of the pairs close towards each other to place and grip the lateral projecting portions of the copy products (4', 5') between said projection elements (B1; C1, C2);

(c) the pairs (1, 2), with the gripped projecting portions of the copy products therebetween, diverge laterally from each other to thereby pull the inner and outer printed copy products apart and out from each other (C2, C'2) until the copy products (4', 5'), gripped between the projection elements (10–13) are clear of each other (B2; C3, C'3); and

(d) the upper and lower systems spread apart to release the copy products (4'', 5'') from gripping engagement by said projection elements (C4, C'4).

4,598,903

BOARD FOR FEEDING SINGLE SHEET PAPER

Masahiko Sarumaru, 2-7, Hama Khoshien 3-chome, Nishinomiya-shi, Japan

Filed Jun. 13, 1984, Ser. No. 620,155

Claims priority, application Japan, Jun. 17, 1983, 58-093684[U]

Int. Cl.[4] B65H 5/00

U.S. Cl. 271—264 1 Claim

1. A board having two opposite sides for feeding a single sheet of paper characterized in that holes for paper feeding which are to be engaged by a sprocket for paper feeding of a printer are formed at specified intervals on said two opposite sides of said board, a member for gripping a rear end of the single sheet of paper and a member for gripping a front end of the single sheet of paper respectively are formed on a back and a front surface of the board at a specified distance therebetween in the paper feeding direction thereby securing the single sheet of paper to the board by gripping the front and rear end parts of the paper with the paper front and rear gripping members, said paper front end gripping member being formed by bending a wing piece made of plastic in a direction transverse of the board, so that its opening part is directed toward a reverse paper feeding direction, and attaching it on the board front surface and said paper rear end gripping member being formed by bending a wing piece made of plastic in a direction transverse of the board so that the opening part is directed towards a reverse paper feeding direction, and attaching said paper rear end gripping member on the back surface of the board and a cut out part for passing the paper rear end part through the board for attaching the paper rear end part to the paper rear end gripping member.

4,598,904

WATER TRAMPOLINE

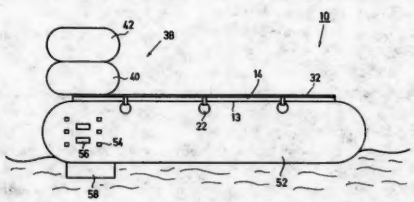
Erland Roth, Altenstadt, Fed. Rep. of Germany, assignor to Corvinus & Roth GmbH, Altenstadt, Fed. Rep. of Germany

Filed Oct. 19, 1984, Ser. No. 662,672

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1984, 8429851[U]

Int. Cl.[4] A63B 5/18

U.S. Cl. 272—65 10 Claims



1. A water trampoline comprising a buoyant inflatable base including a plurality of individual buoyant chambers interconnected to define said base, a support frame consisting of an assembled plurality of individual legs, attached to and mounted directly on said base, a jumping cover attached to said support frame to define a flexible sheet extending substantially over at least the inner perimeter of said frame and supportingly secured thereto at spaced positions around said frame by a plurality of resilient elements; shock absorbing cover means overlying said frame and the periphery of said jumping cover to prevent contact between a user and said frame and said resilient elements supporting said jumping cover thereon, and a detachably connected raised cushioned platform positioned to overlie a portion of said shock absorbing cover and a portion of said support frame and a portion of said inflatable base in stacked array to provide an elevated takeoff area.

4,598,905

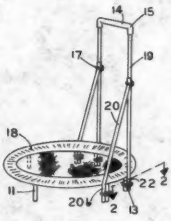
TRAMPOLINE EXERCISE STEADING STRUCTURE

Charles K. Vrana, 60 Helen La., Ft. Myers Beach, Fla. 33931

Filed Dec. 20, 1984, Ser. No. 684,079

Int. Cl.[4] A63B 5/00

U.S. Cl. 272—65 1 Claim



1. In combination, an exercise steadying structure removably attached to a trampoline, said trampoline having a central resilient surface on a frame supported by a plurality of spaced apart legs, said resilient surface acting as a rebound surface, said exercise steadying structure comprising:

(a) two sturdy upright members positioned apart on one side of said trampoline, said upright members being removably attached to a respective first pair of legs of said trampoline,

(b) said upright members joined and spanned at the top by a horizontal bar for user hold-on purposes, said bar having at each end a turned down sleeve section for slipping over the top end portions of said upright members for easy disassembly,

(c) two diagonal support bar members each detachably connected at one end to the midpoint of a corresponding upright member and detachably connected at the other end to a respective second pair of legs of said trampoline; and

(d) leg attachment means comprising double U-shaped inserts positioned between each trampoline leg and the corresponding upright member or support bar member, and U-bolt means for detachably securing each said leg to its corresponding member.

4,598,906

DEVICE FOR ADJUSTABLY POSITIONING A CROSS BAR

Harold L. Sansbury, 1322 W. 264th St., Harbor City, Calif. 90710

Filed Nov. 8, 1984, Ser. No. 669,640

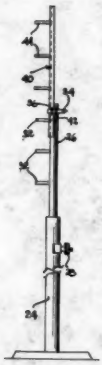
Int. Cl.[4] A63K 3/04; A63B 5/02; A62B 1/20; E04H 17/00

U.S. Cl. 272—103 17 Claims

1. An adapter set comprised of a pair of adaptors for attachment to a pair of upright standards forming part of athletic equipment with a plurality of vertically spaced apart outwardly extending arms on each of said standards and a cross bar supported by one or more arms on the standards, each said adaptor comprising:

(a) an elongate relatively rigid frame adapted for vertical disposition parallel to one of the standards of said athletic equipment,

(b) means forming an aperture in each said frame for attachment to an associated standard in such manner so as to have its length generally parallel to that of the standard and to be closely spaced thereto, the aperture on each said frame being located so that the distance between the upper end or lower end of the frame and the aperture is less than the distance between each of a pair of arms on each said standard, and



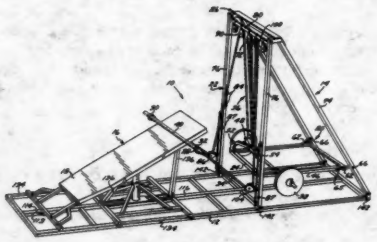
(c) at least one arm on each said frame extending outwardly therefrom in generally the same direction as the one or more arms on the standards and which arm on each frame can be located above the uppermost of the arms on the standards or below the lowermost of the arms on the standards and are also adapted to receive and hold the end of a cross bar thereon, the aperture on each frame being sized to receive an outwardly extending arm on one of the standards.

4,598,907

WEIGHT LIFTING TYPE EXERCISE MACHINE

Arden I. Ross, 6820 Espanita St., Long Beach, Calif. 90815, assignor to Arden I. Ross and Wallace L. Ross, both of Long Beach, Calif., a part interest

Filed Aug. 2, 1982, Ser. No. 404,329
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—117 **9 Claims**



1. An exercise apparatus for lifting weights using a flexible line having a first end and a second end, which ends are manually manipulable, either separately or simultaneously, said apparatus comprising:

a vertical frame having an upper and lower portion and a horizontally-extending base;

a weight platform perpendicular to said vertical frame having a free-swinging end configured for carrying said weights and an opposite end disposed adjacent the lower portion of said frame;

a plurality of upper pulleys coupled to the upper portion of said vertical frame;

connection means pivotally connecting the lower portion of said vertical frame to said opposite end of said weight platform, whereby the free-swinging end of said weight platform will remain in a generally vertical plane below said upper pulleys during normal swinging movement of said platform and the pivotable opposite end being attached to the frame at a position more remote from the user than the free end of the platform; and

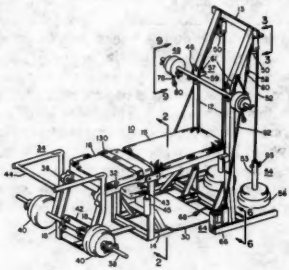
an opposing lift pulley attached to the free-swinging end of said weight platform, the intermediate portion of said flexible line being woven through said upper pulleys and said opposing lift pulley.

4,598,908

WEIGHT LIFTING GYM

Harold W. Morgan, Box 234, R.D. #1, Port Matilda, Pa. 16870

Filed Feb. 16, 1984, Ser. No. 580,652
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 **9 Claims**



1. A weight lifting gym, comprising in combination:

a bench

a hinged backrest pivotally attached to said bench;

a cable, pulley connected to said bench and attached to lifting weights;

a pulley/roller device adapted to guide said cable, said pulley/-roller device being attached to said bench;

a barbell positioned upon said bench and attached to said cable, said barbell is comprised of, in combination:

a hollow handle having pulley housings at each end portion thereof;

a solid shaft within said hollow handle;

two cable pulleys rotatably positioned at the end portions of said hollow handle, one of said pulleys having a plurality of holes therethrough;

two cables, each wrapped around one of said pulleys and extending outwardly therefrom;

a pulley spring attached to one of said pulleys in winding relationship with said cable;

a hold-release device attached to one of said pulley housings connecting said pulley housing to said pulley;

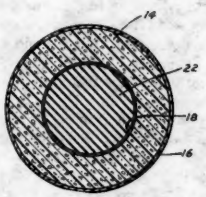
means for integrally attaching said hollow handle to said shaft;

a leg lift-rowing device pivotally attached to said bench.

4,598,909
SOFT GAME BALL INCLUDING MOVEABLE LUBRICATED CORE

Frank D. Ventura, Newburyport, and Randall H. Moormann, Georgetown, both of Mass., assignors to CPG Products Corp., Minneapolis, Minn.

Filed Dec. 24, 1984, Ser. No. 686,311
Int. Cl.[4] A63B 37/00
U.S. Cl. 273—60 B 23 Claims

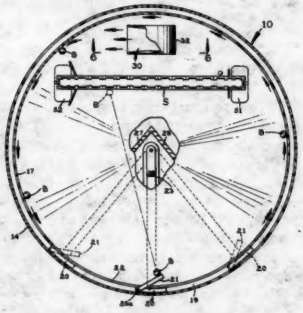


1. A game ball comprising an outer layer of a first material having a generally spherical cavity therewithin, said layer having a substantial radial thickness, and an inner generally spherical core of a second material, means for enabling said inner core to move within and relative to said cavity when subjected to a force exerted thereagainst, said first material possessing a lesser density and a greater degree of compressibility than said second material, and the dimensions of said core corresponding to the dimensions of said cavity when neither of said materials is compressed, whereby when the exterior of said layer is impacted to compress said first material at one side of said core to exert said force against said core, said core shifts within said cavity to momentarily compress said first material at the other side of said core and at the same time to deform said cavity to avoid splitting said outer layer.

4,598,910
SURFACE BALL GAME APPARATUS

Ronald D. Halliburton, Delray Beach, Fla., assignor to Arcade Engineering, Inc., Deerfield Beach, Fla.

Filed Apr. 5, 1985, Ser. No. 720,253
Int. Cl.[4] A63F 7/02, 7/30
U.S. Cl. 273—119 A 13 Claims



7. A surface ball game apparatus comprising:
means defining an upwardly-facing playing surface with a rounded periphery and a wall extending up from said playing surface along its rounded periphery;
an air blower having a canopy extending up from said playing surface and operative to blow air across the top of said playing surface along the inside of said wall to propel game balls along said rounded periphery of the playing surface, said canopy being spaced from said wall far enough to permit a game ball to roll between them along said rounded periphery of the playing surface;
ball striker means spaced from said air blower along the rounded periphery of the playing surface for selectively deflecting a ball across the playing surface;
and target means positioned with respect to said playing surface away from said ball deflector means to be struck by a ball deflected by said deflector means.

4,598,911
GOLF SWING INSTRUCTIONAL AID

Pasquale Lepera, 83 Chestnut St., Ramsey, N.J. 07446

Filed Jul. 16, 1984, Ser. No. 631,392
Int. Cl.[4] A63B 69/36
U.S. Cl. 273—186 A 14 Claims

1. A golf swing instructional aid comprising:
an elongated support member;
golf ball simulation means having the appearance of a spherical golf ball mounted on said member adjacent one end thereof for support thereby; and
mounting means on said support member adapted to mount said member on the shaft of a golf club, said elongated support member and said mounting means cooperatively adapted to position said golf ball simulation means in front of and immediately adjacent the club face of said golf club, on an imaginary line substantially perpendicular to the desired point of contact on the club face,
so that a user of the club can see that the correct position of the club face with respect to a golf ball at the moment of impact, visualize the flight path of the ball and thereby practice the correct positioning of the user's hands and body with respect to the club and ball during practice golf swings.

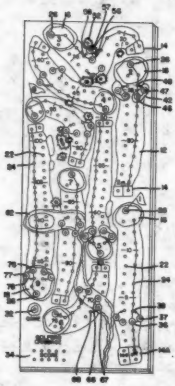
4,598,912
SPORTING CRIBBAGE GAME

Marjorie A. Kendrick, and William M. Kendrick, both of P.O. Box 124, Eaton, N.H. 03832

Filed Sep. 27, 1984, Ser. No. 654,970
Int. Cl.[4] A63F 3/00
U.S. Cl. 273—245 20 Claims

1. An improved cribbage game using a cribbage gameboard formed with at least two rows of a specified number of cribbage scoring pegholes for respectively scoring the points earned from play of cribbage card hands by at least two players, and pegs for tallying said points on the gamebaord by counting cribbage scoring pegholes and moving pegs along respective rows of cribbage scoring pegholes according to said earned points until one of the players earns 121 points thereby winning the game, the improvement comprising:
said cribbage gameboard being formed with the graphic representation thereon of a sporting course for a selected sport, said rows of cribbage scoring pegholes comprising non-linear tracks following the course, each track comprising a separate identifiable continuous sequence delineated by gameboard indicia from the beginning to the end of the sporting course, each track comprising 121 cribbage scoring holes for scoring and tallying points from the beginning to the end of the cribbage game, said rows through the course comprising a plurality of detours from

the tracks, each detour starting from a sporting obstacle cribbage scoring peghole delineated by gameboard indicia on the track and terminating at a return cribbage scoring peghole on the track with at least one additional off-track peghole in between, said off-track peghole delineated by gameboard indicia, said gameboard being formed with graphic representations of sporting obstacles or hazards characteristic of the selected sport coinciding with said detours, thereby adding additional off-track pegholes to the course followed by the pegs of players and retarding progress of the pegs through the gameboard when the



pegs stop in a sporting obstacle cribbage scoring peghole after scoring and tallying the points earned from a play of a cribbage card hand;

and a set of supplemental sporting rules supplementing the rules of cribbage, said set of supplemental sporting rules being characteristic of the selected sport and specifying that players must follow a detour when pegs of players stop in a sporting obstacle cribbage scoring peghole upon scoring and tallying the points earned from play of a cribbage card hand, and that a player who first completes a respective track of 121 cribbage scoring pegholes through the course wins the cribbage game.

4,598,913

CENTRIFUGAL-TYPE SLIDE RING SEAL

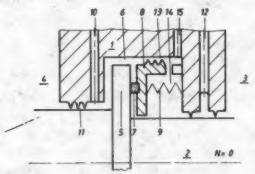
Joachim Kotzur, Oberhausen, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,701

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441351

Int. Cl.[4] F16J *15/34, 15/40*

U.S. Cl. 277—3 **21 Claims**



1. A liquid sealing shaft seal for a rotatable shaft comprising a housing disposed around the shaft with an outside space on one side thereof and an inside space on an opposite side thereof, the shaft extending through the outside and inside spaces, said housing having means defining a seal chamber, a seal disc fixed to the shaft and extending into said seal chamber, said seal disc having side faces, a piston mounted for axial movement to said housing toward and away from one of said disc side faces, said piston at least partly bounding said chamber, at least one slide ring connected to said piston and engaged against said one disc side face in one axial position of said piston and spaced away from said one disc side face in another axial position of said piston, resilient means connected to said piston for biasing said piston toward said one disc side face and means for supplying sealing liquid to said seal chamber so that with rotation of the shaft, corresponding rotation of said seal disc causes a circumferentially induced pressure increase of sealing liquid in said seal chamber which moves said piston axially from its one axial position to its other axial position, said means for supplying sealing liquid comprising said housing including at least one supply bore opening into said seal chamber, at least one floating ring mounted for radial movement to said housing, said floating ring having a surface facing the shaft and defining with the shaft a sealing gap establishing communication between said seal chamber and said outer space.

4,598,914

SEALING AND BEARING MEANS BY USE OF FERROFLUID

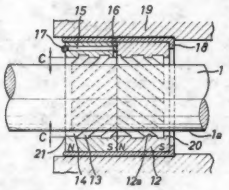
Kyozaburo Furumura, Ninomiya; Hiromi Sugi, Fujisawa; Yasuo Murakami, Fujisawa, and Hiromitsu Asai, Fujisawa, all of Japan, assignors to Nippon Seiko K.K., Tokyo, Japan

Division of Ser. No. 463,572, Feb. 3, 1983, Pat. No. 4,486,026. This application Jun. 27, 1984, Ser. No. 625,046

Claims priority, application Japan, Feb. 10, 1982, 57-18840; Feb. 10, 1982, 57-18841; Feb. 10, 1982, 57-18842

Int. Cl.[4] F16J *15/40, 15/54;* **F16C** *33/82*

U.S. Cl. 277—80 **7 Claims**



1. A sealing a bearing assembly for a rotating shaft, which comprises:

a cylindrically-shaped magnetic member concentrically-disposed about said shaft and formed of a magnetic material, said cylindrically-shaped magnetic member having a cylindrically-shaped surface in siding contact with said shaft, said cylindrically-shaped surface of said cylindrically-shaped magnetic member formed with grooves; and

a ferrofluid disposed between said surface of said cylindrically-shaped magnetic member and said shaft whereby said groove generates dynamic pressure of said ferrofluid by rotation of said shaft within said cylindrically-shaped surface of said cylindrically-shaped magnetic member.

4,598,915

GASKET SEAL BETWEEN SEWER PIPE AND MANHOLE OPENING

Noël Gilbert, 282-14e Ave., La Gundeloupe, Quebec, Canada (G0M 1G0)

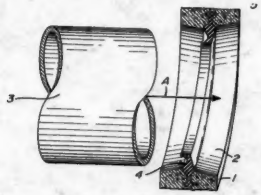
Filed Nov. 5, 1985, Ser. No. 795,233

Int. Cl.[4] F16J *15/10, 15/32;* **F16L** *21/02*

U.S. Cl. 277—207 A **7 Claims**

1. An annular elastomeric gasket for resiliently supporting a sewer pipe in a manhole opening and sealing the space between

the wall of the opening and the surface of the pipe, said gasket, when in unstressed state, having an outer cylindrical flange member extending axially on both sides of the midplane which is normal to the axis of the pipe, a web extending radially inwardly from a mid-region of the inner surface of said cylindrical flange member and integral therewith, said web and said flange being adapted for embedment in settable material lining the manhole opening, an enlargment extending radially inwardly from said web and integral therewith, forming a sealing ridge proximate to said web and which laterally protrudes from one side face of said web, said enlargment defining a



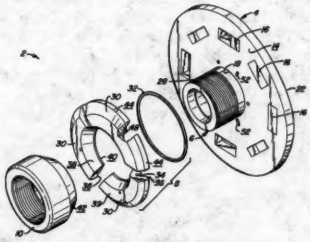
generally flat lateral surface merging with said sealing ridge and radially inwardly extending therefrom and tapering from said ridge toward said midplane, and a sealing lip depending from the radially inner end portion of said enlargment, extending at generally right angle to said midplane and laterally protruding from said lateral surface, said lip having a lateral surface joining at an angle with the lateral surface of said enlargment, said lip having an inner diameter substantially less than the outer diameter of said pipe, said sealing ridge and said sealing lip adapted to contact the external surface of said pipe at two axially spaced zones with said two lateral surfaces defining an annular void therebetween.

4,598,916

MAGNETIC SAW CHUCK

John McGehee, Ukiah, Calif., assignor to Ukiah Machine & Welding Inc., Ukiah, Calif.

Filed Dec. 6, 1984, Ser. No. 678,721
Int. Cl.⁴ B23B *5/34, 31/40*
U.S. Cl. 279—1 M **3 Claims**



1. An improved magnetic saw chuck of the type having a magnetic chuck plate, an arbor, the plate and arbor having a common axis, a segmented ring positioned about the arbor and adjacent a saw engaging surface of the magnetic chuck plate, the segmented ring having a saw eye engaging outer surface and a tapered inner surface, and a jam nut threadably mounted to the arbor and having an outer tapered surface complementary with the inner tapered surface segments for forcing the split ring segments radially outwardly against the saw eye, wherein the improvement comprises:

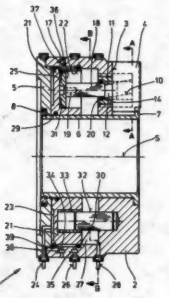
means for preventing relative rotary movement of the radially expandable ring segments so the saw eye engaging outer surface remains concentric with the axis, said relative rotary movement preventing means including a pin and a radially extending pin guide surface for each of said split ring segments.

4,598,917

POWER CHUCK, PARTICULARLY FOR TURNING MACHINES

Karl Hiestand, Pfullendorf, Fed. Rep. of Germany, assignor to S M W Schneider & Weisshaupt GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 442,793, Nov. 18, 1982, abandoned.
This application Jan. 22, 1985, Ser. No. 693,132
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1981, 3146171
Int. Cl.⁴ B23B *31/30*
U.S. Cl. 279—1 J **14 Claims**



1. A power chuck, comprising:

a cylindrical chuck body defining an annular chamber and having a central axial bore and a plurality of radially extending guide grooves defined in said body and extending radially of said axial bore;

a jaw guided in each of said grooves for radial inward and outward movement for clamping and releasing a workpiece positioned in said bore and having a drive surface thereon;

a drive member for each jaw axially displaceable in said body and having an obliquely extending driving surface engaged with said drive surface of said jaw for displacing said jaw;

a separate setting piston for each drive member, each settng piston mounted in said chuck body for displacement in an axial direction of said chuck body and connected directly to one drive member for movement with said one drive member;

a single annular actuating member movably mounted in said annular chamber of said chuck body on one axial side of each setting piston and engageable with each setting piston to jointly move each setting piston in one axial direction, said actuating member defining a first annular pressure space with said chuck body in said annular chamber;

a first pressure connection connected to said body and communicating with said first pressure space for supplying pressure fluid to said first pressure space to move said annular member axially in said annular chamber;

each setting piston defining a separate second pressure space;

said body defining a passage connected to all of said separate second pressure spaces for communicating all of said separate second pressure spaces with each other, said second pressure space and said passage being independent of said first pressure connection and said first pressure space;

a second pressure connection connected to said body and communicating with said passage for supplying pressure fluid to said passage independently of said first pressure connection;

pressure means connected to said second pressure connection for supplying pressure fluid to said passage to cause movement of each setting piston independently to subject each respective driving member to a pressure so as to move each respective driving member to displace each jaw against a workpiece independently, said pressure means being connected to said first pressure connection for supplying pressure fluid to said first pressure connection independently of the supply of pressure fluid to said second pressure connection for moving said annular actuator axially in a direction toward and against each setting piston; and

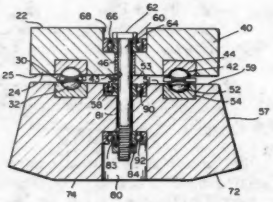
pressure relief means connected to said body and communicating with said passage for venting pressure fluid at a selected pressure from said passage so that with pressure fluid supplied to said first pressure connection said actuator can move toward and engage with each setting piston, said pressure relief means comprising a third pressure connection which is independent of said first pressure connection and which is connected to said body and communicating with said passage, and a pressure relief valve in said third pressure connection.

4,598,918

ROLLER DISC ASSEMBLY AND SKATE

Jose A. Rodriquez, 2921 Briggs Ave., Bronx, N.Y. 10457

Filed Apr. 5, 1985, Ser. No. 720,350
Int. Cl.[4] A63C *17/08*
U.S. Cl. 280—11.24 **14 Claims**



1. A roller disc assembly comprising:

a stationary disc platform having a tap hole having an axis;

a ball bearing ring lying horizontally within said hole in a plane perpendicular to said axis;

a cylinder defining the inward wall of said ball bearing ring, said cylinder being freely rotatable and forming part of a tubular channel perpendicularly penetrating through the width of said disc platform along said axis;

a disc wheel;

a central flat circular surface forming the lower face of said disc wheel;

a tubular channel formed by an aperture directed perpendicular to said surface and penetrating the full width of the disc wheel;

a ball bearing ring lying horizontally within said aperture, said disc platform and disc wheel channels being aligned and of essentially equal diameter;

a ball bearing ring communicating with a bottom surface of said disc platform and a top surface of said disc wheel; and

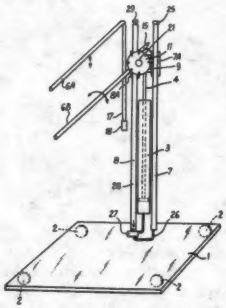
a connecting member passing through both of said disc platform and disc wheel tubular channels to fastenably hold together said disc platform and disc wheel.

4,598,919

TROLLEY FOR MOVING TEXTILE PIECES BETWEEN WORKSTATIONS

Michel Letard; Daniel Renouvin, and Joseph Dupont, all of Tinchebray, France, assignors to Societe Normande de Confection, Tinchebray, France

Filed Jun. 5, 1984, Ser. No. 617,479
Claims priority, application France, Jun. 7, 1983, 83 09417
Int. Cl.[4] B62B *1/44*
U.S. Cl. 280—79.1 R **7 Claims**



1. A trolley comprising a platform mounted on wheels, a vertical jack comprising a member movable vertically upward and downward, said member having a free end and a clamp mounted at said free end, said clamp having two contra-acting branches, said clamp including maneuvering means linking said branches and for controlling relative movement of said branches towards and away from each other, at least one of said branches extending generally parallel to the plane of said platform, said maneuvering means including means for immobilizing said one branch in a selected one of a plurality of rotational positions, said clamp being supported through said one branch on said member, said maneuvering means including a ratchet mounted on said member resiliently urged into a first position, a disk mounted on one end of said one branch, said disk having a perimeter including a plurality of spaced notches for receiving said ratchet when in said first position, a shaft extending from said disk on one side thereof, said one branch being attached to said disk on the side thereof opposite said one side coaxially with said shaft, said disk including slide means, said other branch including an arm having a portion received in said slide means, said arm having a plurality of depressions spaced therealong on one side thereof, said disk having a small ratchet carried thereon and movable into and out of engagement with a said depression.

4,598,920

AUTOMATIC TRANSMISSION FOR A BICYCLE AND THE LIKE-PEDALED APPARATUS

Robert Dutil, 10537 Boul. Lacroix, St. Georges, Beauce-Sud, P. Q., Canada (G5Y-1K2), and Raymond Gilbert, Rang Des Pepins, La Guadeloupe, Beauce-Sud, P. Q., Canada (G0M-1G0)

Filed Aug. 6, 1984, Ser. No. 637,788
Int. Cl.[4] B62M *9/06;* F16H *55/30*
U.S. Cl. 280—236 **30 Claims**

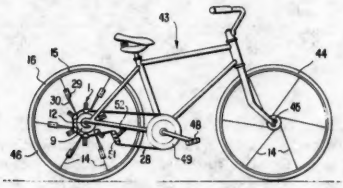
1. An automatic transmission for a linked chain-driven wheel having an axis of rotation where the ratio of the linear speed of the chain to the angular speed of the wheel about the axis of rotation is automatically and substantially continuously adjusted, comprising:

(1) a plurality of engaging means circumferentially disposed about the axis of rotation, and, together, defining a sprocket of variable diameter for receivably engaging said linked chain, a portion of said plurality of engaging means

engaged by said linked chain and at least one of said plurality of engaging means free of engagement with said linked chain;

(2) sprocket varying means, operably connected to said engaging means, for varying the radial position of said engaging means, and hence, the diameter of said sprocket, in relation to the angular speed of said wheel; said sprocket varying means rotatable about an axis in common with said axis of rotation of said wheel;

(3) connecting means for operably connecting the said sprocket varying means to said wheel;



(4) releasable locking means for automatically locking in a radial position the engaging means of the said sprocket which are being engaged by said chain and automatically unlocking said at least one engaging means of the said sprocket which is not being engaged by said chain;

whereby on angular rotation of said wheel those engaging means engaged by said chain are locked into a drive position for transmission of power to said wheel and said at least one engaging means not engaged by said chain is free to be radially moved by said sprocket varying means to automatically and substantially continuously establish a different sprocket diameter in relation to the angular speed of said wheel.

4,598,921

WHEELCHAIR

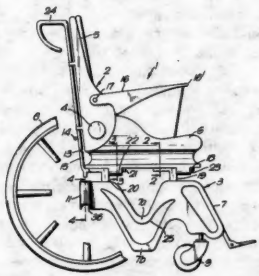
Robert Fenwick, Guildford, England, assignor to Lieuse Technology Limited, London, England

Filed Nov. 13, 1984, Ser. No. 670,190

Claims priority, application United Kingdom, Nov. 14, 1983, 8330289

Int. Cl.⁴ B62M *1/14*

U.S. Cl. 280—242 WC **13 Claims**



1. In a wheelchair comprising a foldable carriage, wheels rotatably supported on the carriage, and a substantially rigid seat removably connected to said carriage, the improvement wherein:

(a) the carriage includes left and right side frames, collapsible bracing means between said left and right side frames for permitting movement of said left and right side frames towards and away from one another to a collapsed condition and an erected condition, respectively, and first locating means and first retaining means on each said side frame;

(b) the substantially rigid seat includes left and right second locating means and left and right second retaining means; and

(c) wherein the left and right locating means of at least one of the substantially rigid seat and the carriage has a shape which tapers when viewed from the front to permit self-centering camming engagement of the locating means of the seat and the carriage; the various said first and second locating means and first and second retaining means being arranged such that engagement of the respective left and right first and second locating means positions the substantially rigid seat relatively to the carriage and spreads the carriage side frames to a fully erected configuration merely by placing the substantially rigid seat on top of the carriage, and that sliding movement of the seat relative to the carriage brings said left and right first and second retaining means into engagement to maintain the substantially rigid seat on the carriage.

4,598,922

BICYCLE FRAME

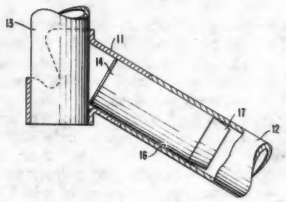
Dieter Kleinebenne, and Fred Kleinebenne, both of Bielefeld, Fed. Rep. of Germany, assignors to Huffy Corporation, Dayton, Ohio

Filed Jun. 4, 1982, Ser. No. 385,284

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1981, 8117517[U]

Int. Cl.⁴ B62K *11/02*

U.S. Cl. 280—279 **10 Claims**



1. In a bicycle frame including a plurality of tubes made of a light metal at least one sleeve coupling connecting two of these tubes together, a separate pipe socket made of steel, fastened within said sleeve coupling so as to project therefrom, with one of said two tubes being fitted around said pipe socket to contact the exterior surface of said pipe socket, and a layer of non-metallic adhesive disposed between, and connecting together, the interior surface of said tube and the exterior surface of said pipe socket, the improvement wherein said exterior surface is cylindrical in shape along the bonding surface of said socket and is randomly roughened to have a fine-grained surface.

4,598,923

BICYCLE PORTABLE AS A BAG

Lajos Csizmadia, Budapest, Hungary, assignor to Licencia Talalmanyokat Ertekesito Vallalat, Budapest, Hungary

PCT No. PCT/HU83/00012, § 371 Date Nov. 16, 1983, § 102(e) Date Nov. 16, 1983, PCT Pub. No. WO83/03232, PCT Pub. Date Sep. 29, 1983

PCT Filed Mar. 16, 1983, Ser. No. 557,157

Claims priority, application Hungary, Mar. 16, 1982, 792/82

Int. Cl.⁴ B62K *15/00*

U.S. Cl. 280—287 **6 Claims**

1. A portable bicycle which comprises:

an elongated first casing having a front end and a rear end;

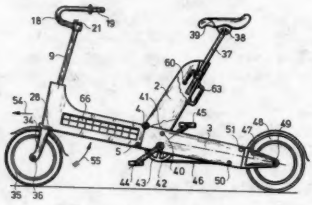
a front wheel received in a fork pivotable about a first horizontal pivot axis on said front end whereby said front wheel is receivable in part in said first casing and projects therefrom above and below said first casing in a folded condition of said bicycle;

a steering post with a handlebar mounted in said front end and coupled with said fork for steering same in an erect condition of the bicycle, said steering post being foldable to lie generally along the length of said first casing in said folded condition;

a second elongated casing of substantially equal length as said first casing and having a front end pivotally connected to said rear end of said first casing by an axis disposed near the bottom of said first casing whereby said second casing is swingable into a position below said first casing in said folded condition and receives a portion of said wheel projecting below said first casing;

a pedal assembly mounted close to said front end of said second casing;

a rear wheel assembly mounted on a rear end of said second casing and pivotally connected thereto so as to be swing-



able to introduce a rear wheel of said rear wheel assembly into said second casing in said folded condition;

means in said second casing coupling said assemblies for rotating said rear wheel upon actuation of said pedal assembly in said erect condition;

a third elongated casing pivotally connected to said rear end of said first casing at an upper point thereon whereby said third casing is swingable from an upright position in said erect condition in which said third casing is supported on said second casing into a position in which said third casing lies along said first casing and receives a portion of said front wheel projecting upwardly from said first casing in said folded condition;

a seat post carrying a saddle mounted on said third casing and extendable therefrom in said erect condition; and

at least one spring loaded pin for releasably locking one of said rear wheel assembly and said third casing to said second casing in said erect condition, said casings forming a rectangular housing enclosing said wheels, said steering post, said handlebar and said seat post and saddle in said folded condition.

4,598,924

TANDEM TRAILER SYSTEM

Gerard Arguin, Spencer, Mass., assignor to Arguin Trailer Frame, Inc., Spencer, Mass.

Division of Ser. No. 520,993, Aug. 9, 1983, and Ser. No. 294,775, Aug. 20, 1981, Pat. No. 4,400,004. This application Feb. 15, 1985, Ser. No. 702,009

Int. Cl.[4] B62D *53/08*

U.S. Cl. 280—408 **2 Claims**

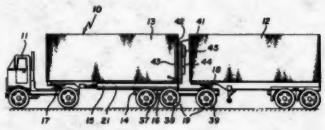
1. Trailer system, comprising:

(a) a trailer unit, including a cargo container to be drawn behind a highway tractor and behind which can be drawn a second trailer unit,

(b) a chassis on which the container is mounted, the chassis having an upper portion and a lower portion of substantially equal length, the lower portion being formed of at least two spaced, parallel beams, each beam being integral throughout its length, the said lower portion being longitudinally slidable relative to the upper portion from a first position generally co-extensive with the upper portion to a second position where it extends beyond the end of the cargo container,

(c) a first attaching means associated with the front end of the container for connection to the highway tractor,

(d) a second attaching means including a fifth wheel associ-



ated with the lower portion of the chassis, so that, when the second portion is in the second position, another trailer can be attached to it, the second attaching means being located on the lower portion far enough rearwardly that the front end of the second trailer unit can swing relative to the cargo container during turning without striking the rear end of the cargo container, and

(e) three sets of wheels mounted on the said lower portion of the chassis.

4,598,925

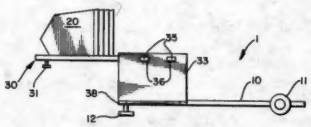
TRAILER WITH IMPROVED FOLDING GOOSENECK FOR CARRYING

Steven R. Riggin, 729 Grapevine Hwy., Suite 321, Hurst, Tex. 76054

Filed Sep. 6, 1983, Ser. No. 529,736

Int. Cl.[4] B62D *53/06*

U.S. Cl. 280—425 A **2 Claims**



1. In a drawn vehicle having a rectangular horizontally disposed rigid chassis including:

(i) longitudinal chassis members, and

(ii) transverse chassis members, and

(iii) a plurality of ground engaging wheels

a folding gooseneck means connected to the chassis for connecting said drawn vehicle to a draft vehicle the improved structure for folding gooseneck comprising in combination with the above:

two independent rigid gooseneck members each having

(i) an edge rotationally hinged to the chassis wherein rotational movement is possible around an axis parallel to the longitudinal axis of said drawn vehicle

(ii) a longitudinal member with coupling means to afford rigid attachment to opposite gooseneck member.

4,598,926

ASYMMETRICAL FOUR-BAR LINK TRAILER HITCH

Norman W. Gallatin, Box 120, Garrison, Iowa 52229

Filed Sep. 30, 1982, Ser. No. 428,537

Int. Cl.[4] B62D *53/00*

U.S. Cl. 280—459 **7 Claims**

1. A method of towing a trailer behind a vehicle, wherein said vehicle has a rearward end;

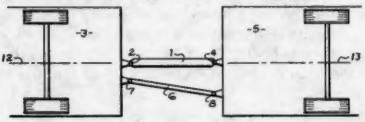
said trailer has a forward end;

an asymmetrical four-bar link hitch means connects said

trailer means to said vehicle, said hitch means includes a main hitch member and a steering hitch member, each of said hitch members having rearward and forward ends;

said hitch members have pivotal connection means at their rearward ends and at their forward ends;

said main hitch member extends longitudinally in substantial alignment with the longitudinal axis of said vehicle and said trailer means;



said steering hitch member is laterally spaced relative to said main hitch member with the forward ends of said hitch members being spaced apart a distance less than the rear ends thereof; and

said method being performed by using the hitch means to pull the trailer behind the vehicle, and turning the vehicle left and right while said steering hitch member remains located on only one side of the main hitch member.

4,598,927

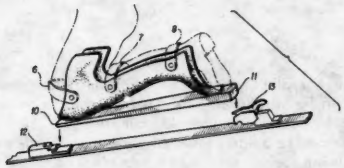
LONG KNEE-FOOT BOOT FOR SKIING/SLEDDING

F. Javier Monreal, 4242 Barker Hill Rd., Jamesville, N.Y. 13078

Continuation-in-part of Ser. No. 594,367, Mar. 28, 1984, abandoned. This application Apr. 3, 1985, Ser. No. 719,525

Int. Cl.[4] A63C *5/00*

U.S. Cl. 280—611 **3 Claims**



1. A ski boot for receiving and supporting the knee, lower leg, and foot of a skier while in a kneeling position, comprising:

an open, contoured shell formed from a continuous sheet of lightweight, semirigid material, said shell extending from the knee to the foot of the skier and having a front portion for supporting the skier's knee, a middle portion for supporting the skier's lower leg, and a rear portion for supporting the skier's foot, said front portion having side portions extending upwardly from one third to one half the height of the skier's thigh, said side portions being biased inwardly for engaging the sides of the skier's thigh, said front portion further having an open portion located between the front edges of said side portions through which the front of the skiers's thigh extends, said middle portion having sides extending upwardly for providing lateral support for the skier's lower leg, said rear portion extending downwardly the entire length of the skier's foot and having a horizontally extending portion for supporting the toe portion of the skier's foot, and a rectangular support base extending substantially the entire length of the contoured shell, the bottom surfaces of said front portion and said horizontally extending portion beng permanently secured to the top surface of said support base, wherein said support base is adapted to be secured to the top surface of a ski.

4,598,928

RELEASE SKI BINDING

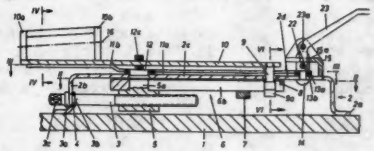
Vladimir Konwitza, Vienna, Austria, assignor to TMC Corporation, Baar, Switzerland

Filed Jan. 19, 1984, Ser. No. 572,101

Claims priority, application Austria, Jan. 21, 1983, 191/83

Int. Cl.[4] A63C *9/081*

U.S. Cl. 280—618 **18 Claims**



1. In a release ski binding comprising an elongate sole plate adapted to be pivotally supported on a ski for movement about a vertical axis and about a transverse axis, which sole plate in the skiing position is held on the ski by a resilient holding mechanism so that a longitudinal axis of said sole plate is parallel to a longitudinal axis of the ski, said resilient holding mechanism being response to a movement of the sole plate relative to the ski and about at least one of said vertical and horizontal axes so that upon reaching a predetermined angle of traverse, effects an opening of a locking mechanism, the improvement comprising wherein said resilient holding mechanism is formed by a U-shaped spring member having a bearing thereon arranged in the region whereat the legs of the U are joined together, wherein support means are provided for supporting said spring member for selective adjustable movement in the longitudinal direction of the ski with respect to said locking mechanism, wherein a sliding member is secured to and movable with said sole plate and is arranged between the legs of the U and wherein said slide member has an enlarged head thereon, said head having two upwardly converging surfaces each slidingly engaging correspondingly formed surfaces on the underside of each of the two legs of said spring member.

4,598,929

VEHICLE SUSPENSION SYSTEM

Naotake Kumagai, Aichi; Minoru Tatemoto, Okazaki; Shozo Takizawa, Okazaki; Hiroyuki Takada, Okazaki, and Mitsuhiko Harara, Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo K.K., Tokyo, Japan

Filed Feb. 2, 1984, Ser. No. 576,204

Claims priority, application Japan, Feb. 3, 1983, 58-16655; Feb. 3, 1983, 58-16656

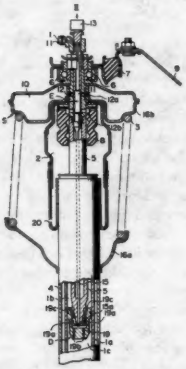
The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.

Int. Cl.[4] B60G *11/26*

U.S. Cl. 280—707 **19 Claims**

1. In a vehicle suspension system having a suspension unit comprised of a shock absorber equipped with a damping-capacity switching mechanism and an air-spring chamber equipped with a spring-constant switching mechanism: car-height sensor means for detecting at least one of the compressed and stretched conditions of a suspension unit and producing a corresponding output signal; control means for feeding a control signal to said damping-capacity switching mechanism and spring-constant switching mechanism in order to change the damping capacity of the shock absorber and the spring constant of the air-spring chamber in accordance with the output signal produced from said car-height sensor means, said control means being operative to supply said control signal for increasing both the damping capacity of the shock absorber and the spring constant of the air-spring chamber to said damping-capacity switching mechanism and said spring-constant switching mechanism when the car height detected by said car-height sensor means differs from a standard car-

height by such a value as to exceed a preset value; said shock absorber comprising a cylinder supporting an axle, a piston slidably fitted in said cylinder to divide the space therein into two chambers and being equipped with an orifice passage interconnecting said two chambers, a piston rod connected to said piston and extending upward with its top end supported by a vehicle body; said damping-capacity switching mechanism of the shock absorber comprising a control valve for changing the effective area of said orifice passage of the piston, and a first actuator for driving said control valve; said air-spring chamber comprising a main air-spring chamber disposed coaxially with the piston rod and the cylinder in such a manner as to surround said piston rod and cylinder for supporting the vehicle weight, and an auxiliary air-spring chamber disposed above said main air-spring chamber coaxially with the



piston rod in such a manner as to surround said piston rod; said spring-constant switching mechanism of the air-spring chamber comprising a control rod extending in the interior of said piston rod in the longitudinal direction of the piston rod and being movably mounted so as to vary its position with respect to the piston rod, and a second actuator for changing the position of said control rod; a wall portion of said piston rod surrounding said control rod having openings communicating with said main air-spring chamber and said auxiliary air-spring chamber respectively; and said control rod having an air passage intercommunicating said main air-spring chamber with said auxiliary air-spring chamber through said openings on the wall portion of the piston rod so that the connection and disconnection between said main and auxiliary air-spring chambers are selectively executed by moving said control rod relative to said piston rod.

4,598,930

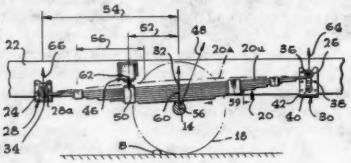
LEAF SPRING VEHICLE SUSPENSION

Paul Smith, 16700 Gledhill, Sepulveda, Calif. 91343

Continuation-in-part of Ser. No. 494,081, May 12, 1983, Pat. No. 4,494,772. This application Oct. 24, 1984, Ser. No. 664,480

Int. Cl.[4] B60G *11/46, 11/56*

U.S. Cl. 280—712 **8 Claims**



1. In a vehicle which has a frame, an axle holding a wheel on either side of the frame, a leaf spring on either side of the frame, each leaf spring having front and rear ends and having a middle attached to said rear axle, and front and rear connectors attaching the front and rear ends of said spring to said frame in continuous connection therewith, the improvement comprising:

an auxiliary load transfer device which is resiliently compressible, said device having an upper end connected to said vehicle frame to support part of the frame weight, and said device having a lower end supported on said leaf by a at a longitudinal location forward of said axle by a distance at least about 25% of the distance between the axle and the front connector, but rearward of said front connector.

4,598,931

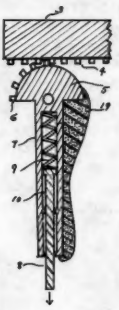
INERTIAL SAFETY NET SYSTEM

Thomas S. Miyada, P.O. Box 430, Summit, N.J. 07901

Filed Jan. 22, 1985, Ser. No. 693,679

Int. Cl.[4] B60R *21/06*

U.S. Cl. 280—749 **4 Claims**



1. An inertial safety net system for vehicles which causes a safety net to be introduced between the vehicle's front seat riders and the vehicle's windshield, comprising:

(a) two pipe-like holders installed under the vehicle's roof, each having an opening in one side and a retaining ridge along the opening for holding within the pipe-like holder a long straight bar;

(b) two long straight bars, each bar having a row of gear teeth along one side, wherein said straight bar is held slidingly in said holder with the row of gear teeth protruding through the opening of each of said holders;

(c) two semi-wheels secured to the vehicle's roof adjacent said bars each of said wheels having a hub and a perimeter defining a curved section and a straight section so that said perimeter has a substantially semicircular shape wherein said curved section has a plurality of gear teeth disposed thereon adapted to engage said row of gear teeth on said bars so that when said bars move forward said wheels turn about 90°;

(d) two primary extensions, each primary extension attached to and protruding from the straight section of each semi-wheel, wherein said extensions are movable from a horizontal position near the vehicle's roof to a vertical position in front of the front seat and the riders when said wheels turn 90 degrees in response to the inertial movement of the straight solid bar; and

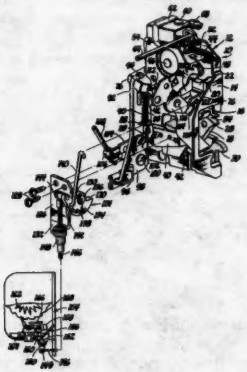
(e) a rectangular primary net having a left short side securely attached to one primary extension and a right short side securely attached to the other primary extension, wherein said net is movable with the semi-wheels from a horizontal position below the roof to a vertical position between the passenger and the windshield.

4,598,932

CONTROL MEANS FOR OCCUPANT RESTRAINT BELT SYSTEM

Michael E. Compeau, Fraser, and Lloyd W. Rogers, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 6, 1985, Ser. No. 730,507
Int. Cl.[4] B60R *22/34*
U.S. Cl. 280—807 3 Claims



1. In a vehicle body having a door movable between open and closed positions, latch means mounted on the door for selectively holding the door in closed position or permitting movement thereof to open position and including a latch bolt movable between latched and unlatched positions, operating means for releasing the latch bolt for movement to unlatched position and including a latch operating lever releasing the latch bolt for movement to unlatched position, restraint belt retractor means mounted on the door, and disabling means operable to disable the retractor, the combination comprising, a latch bolt sensor mounted on the latch means for movement between an unactuated position when the latch bolt is in latched position and an actuated position, wherein the sensor engages the latch bolt when the latch bolt is in unlatched position, first means connecting the sensor to the disabling means for operating the disabling means upon movement of the sensor to actuated position, a connecting member, second means connecting one end of the connecting member to the latch operating lever, third means connecting the other end of the connecting member to the sensor, one of said second and third connecting means including lost motion means connecting the connecting member and one of said lever and sensor in the unactuated position of said sensor and permitting free wheeling movement of the connecting member and said one of said lever and said sensor in the actuated position of said sensor, operation of the latch operating lever releasing the latch bolt for movement from latched position to unlatched position and moving the sensor to actuated position, the lost motion means permitting cessation of operation of the latch operating lever when the sensor is in the actuated position.

4,598,933

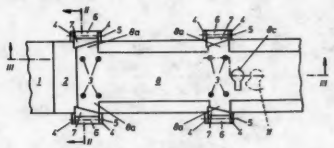
ANTI-THEFT LOCK FOR SKIS

Klaus Hoelzl, Vienna, Austria, assignor to TMC Corporation, Baar, Switzerland

Filed Oct. 17, 1984, Ser. No. 661,767
Claims priority, application Austria, Oct. 21, 1983, 3756/83
Int. Cl.[4] A63C *11/02*
U.S. Cl. 280—809 12 Claims

1. An anti-theft lock for a ski having a ski binding means mounted thereon, said ski binding means having a base plate means adapted to be affixed to a ski, and a ski boot holding means movable between a ski boot releasing position and a ski boot holding position in response to an operation of a safety release mechanism, said anti-theft lock comprising:

means defining plural holes in said base plate means adapted to receive in each thereof a fastening element, at least one of said holes being inaccessible only when said ski boot holding means is in one of said ski boot holding and releasing positions, all of said holes being accessible only when said ski boot holding means is in the other of said ski boot holding and releasing positions; and



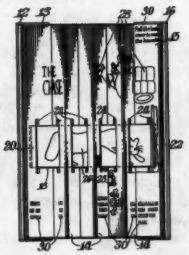
cooperative locking means on one of said ski and said base plate means, and said ski boot holding means separate from said safety release mechanism for releasably locking the position of said ski boot holding means in one of said ski boot holding and releasing positions to thereby render at least one of said holes and, consequently one of said fastening elements inaccessible for preventing removal of said ski binding from said ski by anyone without a means to operate said locking means.

4,598,934

REVERSIBLE BOOK HAVING COVER-CONNECTING INSERT

Mary E. Cashel, 62 Vernon St., Providence, R.I. 02903

Filed Nov. 13, 1985, Ser. No. 797,690
Int. Cl.[4] B42D *19/00, 1/00*
U.S. Cl. 281—5 7 Claims

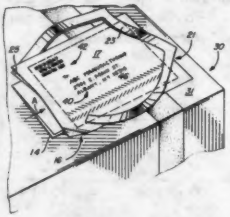


1. A book comprising a front cover and a back cover and an elongate sheet having two ends and two sides, said sheet being folded into a multiplicity of substantially uniform accordian-like folds to form the pages of said book, one end of said sheet being affixed to said front cover and the other end of said sheet being affixed to said back cover, said sheet having vertical slot-like openings through each of said pages, and including a ribbon-like element having at least one illustration thereon and having two ends, one end of said ribbon being anchored to said front cover and the other end of said ribbon being anchored to said back cover, said ribbon extending through each of said vertical slots in said pages.

4,598,935
BUSINESS FORM WITH PACKING LABEL AND METHOD OF USE

Gary E. Stewart, 4050 E. Rancho, Phoenix, Ariz. 85018

Filed Feb. 14, 1983, Ser. No. 466,035
Int. Cl.[4] B42D *15/00*; B41L *1/20*; B65D *27/00*
U.S. Cl. 283—81 5 Claims



1. A business form comprising a plurality of bound stacked leaves each having a front side and back side, said form including

(a) a detachable shipping leaf having

(i) an information recordation area on the front side thereof for describing goods being processed with said form, and

(ii) an address space on the front side thereof for the name and address of the customer requisitioning said goods; and,

(b) a detachable mailing pouch leaf having

(i) an address space on the front side thereof for the name and address of the customer requisitioning said goods, and

(ii) a strip of adhesive on the back side thereof generally circumscribing

said address space on said front side, and

an adhesive free surface on said back side of said mailing pouch leaf,

one of said address spaces on said shipping and mailing pouch leaves being positioned generally directly above the other of said address spaces,

said plurality of bound, stacked leaves comprising said business form being fabricated such that while said business form is contacting a support surface and localized pressure is applied to said business form to complete and inscribe information on said form,

a name and address are simultaneously produced in said address spaces of said shipping and mailing pouch leaves, and

a description of said goods is produced in said information recordation area of said shipping leaf,

said shipping leaf and mailing leaf being detached from said business form after said form is completed and said mailing pouch leaf being attached with said adhesive strip to the surface of a shipping container for said goods with said shipping leaf

positioned and maintained between and contacting said container surface and said adhesive free surface of said back side of said mailing pouch leaf, and

generally circumscribed by said adhesive strip of said mailing pouch leaf.

4,598,936
REMOTE CONTROLLED VACUUM JOINT CLOSURE MECHANISM

David W. Doll, San Diego, and E. Randolph Hager, La Jolla, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

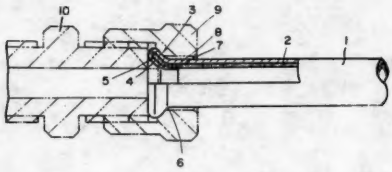
Filed Feb. 22, 1984, Ser. No. 582,507
Int. Cl.[4] F16L *23/00*
U.S. Cl. 285—18 20 Claims

1. A remotely controlled noncircular vacuum joint closure mechanism including first and second flanges for establishing sealed connections with respective first and second members of an evacuated system, wherein each of the first and second members includes a respective mating flange, said closure mechanism comprising:

a tubular member having first and second end portions and a noncircular cross-section, wherein the second end portion thereof is coupled to said second flange;

an expansion joint coupling the first end portion of said tubular member to said first flange;

displacement means mounted on the outside of said tubular member and engaging said first flange for extending said expansion joint and displacing said first flange toward or away from the mating flange of said first member in respectively establishing or removing sealed engagement therebetween;



latch means mounted on the outside of said tubular member for securely engaging the mating flange of said first member in maintaining sealed engagement between the mating flange of said first member and said first flange;

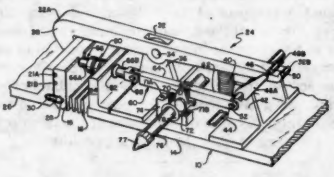
first remote control means coupled to said displacement means for moving said displacement means in a first direction in displacing said first flange toward said first member or for moving said displacement means in a second direction in displacing said first flange away from said first member; and

second remote control means coupled to said latch means for positioning said latch means in a first position for locking said first flange in sealed engagement with the mating flange of said first member or for positioning said latch means in a second position for releasing said first flange from the mating flange of said first member.

4,598,937
PIPE HAVING A DOUBLE FLARED END

Keizo Sugao, Shizuoka, Japan, assignor to Usui Kokusai Sangyo Kabushiki Kaisha, Shizuoka, Japan

Filed Oct. 26, 1984, Ser. No. 665,106
Int. Cl.[4] F16L *9/14*
U.S. Cl. 285—55 2 Claims



1. In a pipe assembly comprising a metal pipe having a double flared end and a tube formed from a corrosion resistant material and fitted tightly in said metal pipe, said corrosion resistant material being selected from the group consisting of synthetic resins and rubber, said double flared end of said metal pipe including an outwardly flared outer wall portion and an inner wall portion, said inner wall portion being unitary with said outer wall portion and being defined by a radially inward bend therein such that said inner wall portion is generally

parallel to and spaced inwardly from said outer wall portion, said inner wall portion defining a seat for a tubular member to which said pipe assembly is connected, said tube having one end held intermediate said inner wall portion and said outer wall portion of said double flared end, the improvement wherein said inner wall portion comprises a conical portion and a cylindrical portion contiguous to and unitary with said conical portion, said cylindrical portion extending beyond a neck defining said double flared end into said tube and held tightly against the inner surface of said tube, said cylindrical portion having a decreasing wall thickness which is smaller than the wall thickness of the rest of said inner wall portion, whereby the conical and cylindrical portions cooperate to prevent axial displacement of said tube relative to said double flared end.

4,598,938

COUPLING DEVICE FOR MAKING A PERMANENT PIPE CONNECTION

Hans Boss, Zelgmatt 12, CH-8132 Egg/Zch; Jürg Pfister, deceased, late of Ebmatingen, and by Lisa Pfister, administrator, Im Grossacker 6, CH-8123 Ebmatingen, all of Switzerland

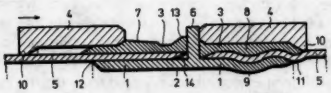
PCT No. PCT/CH84/00114, § 371 Date Mar. 18, 1985, § 102(e) Date Mar. 18, 1985, PCT Pub. No. WO85/00646, PCT Pub. Date Feb. 14, 1985

PCT Filed Jul. 12, 1984, Ser. No. 717,229

Claims priority, application Switzerland, Jul. 19, 1983, 3947/83; Sep. 19, 1983, 5164/83

Int. Cl.⁴ F16L *13/14*

U.S. Cl. 285—382.2 **8 Claims**



1. A coupling device for making a permanent pipe connection, in which the pipe end part (5) is pressed, as a result of cold-forming in zones, by means of a press ring (4) to be displaced axially, to form a positive connection with a connection piece (1) inserted into the pipe end part and belonging to a pipe fitting (2), there being a sleeve (3) which is to be pushed onto the pipe end part and has an annular outer bead (7) and which is deformed when the press ring is pressed on, so that the sleeve material is displaced radially inwards in the bead zone (8), and the pipe fitting having a flange (6), up against which come the pipe end part, the sleeve and the press ring, wherein the press ring (4) has at its rear end an annular inner bead (10) which, when the press ring is pressed onto the sleeve (3), forces the sleeve material radially inwards at the rear sleeve end, and in that the length of the connection piece (1) in relation to the length of the press ring (4) and consequently to the axial position of the annular recess (11) occurring at the rear sleeve end and located in the pipe end part (5) is selected so that the free end (12) of the connection piece does not project beyond the lowest point of this recess.

4,598,939

EXIT DEVICE

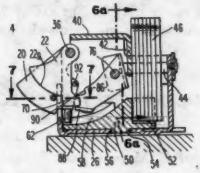
William A. Krupicka; Lawrence D. Butts, both of Charlotte, and Sidney J. Lampley, Monroe, all of N.C., assignors to Scovill Inc., Waterbury, Conn.

Filed Jun. 8, 1984, Ser. No. 618,688

Int. Cl.⁴ E05C *15/02*

U.S. Cl. 292—92 **6 Claims**

1. An exit device comprising a horizontal panic bar, adapted to be mounted waist-high on a swinging door, a latch housing adapted to be secured outward of the door adjacent an end of the panic bar, the latch housing holding a vertically reciprocable slide having similar but opposite cam surface thereon converging to a low point, a latch bolt having stop means thereon and being pivotally mounted in the housing about a vertical axis and moveable from an extended to a retracted position, the latch bolt having follower means normally engaging the cam surfaces at the said low point whereat the latch bolt is extended, lever means pivotally mounted intermediate its ends in the housing on a horizontal pin, one end of the lever held captive in the slide, the other end extending out beyond the



housing at an angle and adapted to be engaged by the panic bar, a blocking leg pivotally mounted in the housing on a vertical axis, the leg occasionally being in blocking position with respect to the stop means, and connecting means between the horizontal pin and the blocking leg so that the initial rotary movement of the horizontal pin upon depression of the panic bar moves the blocking leg so it does not block the retraction of the latch bolt.

4,598,940

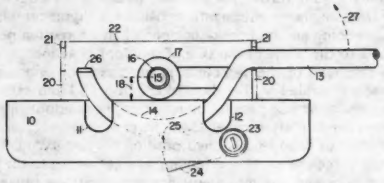
COMBINED LATCH AND HINGE FOR VEHICLE COVERS

Philip M. DeGroat, 823 Pine St., Endicott, N.Y. 13760

Filed Dec. 13, 1984, Ser. No. 681,286

Int. Cl.⁴ E05C *3/04*

U.S. Cl. 292—108 **5 Claims**



1. A combined hinge and latch device for covers for vehicles, comprising:

a. a plate element having horizontal and vertical planar portions at right angles to each other, and an arcuate portion therebetween;

b. means for mounting the plate element to the vehicle;

c. a latch element comprising;

1. a rod element having a handle portion and an arcuate portion, the arcuate portion being formed as a semicircle having a radius and center of curvature;

2. a circular pivot element centered upon the center of curvature of the arcuate portion of the rod element, having a radius less than that of the arcuate portion of the rod element;

3. the circular pivot element being attached to at least the handle portion of the rod element, whereby movement of the handle portion of the rod element in an arcuate path causes the pivot element and the arcuate porton of the rod element to pivot around the center of curvature;

4. means for attaching the latch element to the vehicle cover;

d. the plate element having at least two holes therein, in at least the arcuate portion thereof, the holes being of large enough diameter for the arcuate portion of the rod ele-

ment to freely pass therethrough, and spaced apart sufficiently that the arcuate portion of the rod element may pass through both holes, locking the latch element and plate element together;

e. the radius of the pivot element being chosen such that the pivot element contacts the plate element when the arcuate portion of the rod element is passed through the holes in the plate element, whereby the outer surface of the pivot element rides upon the arcuate portion of the plate element, and the cover may be hinged to the vehicle by the combined plate element and latch element.

4,598,941

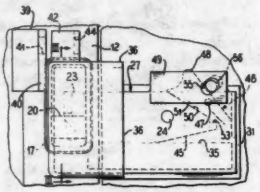
PILFERAGE DETERRENT DEVICE FOR LADING, CARRYING VEHICLES, SUCH AS BOXCARS AND THE LIKE

Stanford C. Nelson, 8 S. Merrill, Park Ridge, Ill. 60068

Continuation-in-part of Ser. No. 298,592, Sep. 2, 1981, abandoned. This application Aug. 4, 1983, Ser. No. 520,179

Int. Cl.[4] E05C *3/10*

U.S. Cl. 292—134 **8 Claims**



1. A pilferage deterrent device for a door assembly for a lading carrying vehicle having a floor and vertical side and end walls upwardly therefrom to form an enclosure and a door opening leading through at least one of said walls a door movable from an open position into a position in alignment with the door opening and into the door opening in a direction perpendicular to the plane of the side of the door, a keeper recessed in a side wall of the vehicle adjacent the door opening and extending parallel to the plane of the door, a latch extending along the door and parallel thereto beyond the door opening, a pivot for said latch eccetric of the center thereof, enabling said latch to drop to a latched position by gravity, said latch having a free end portion extending at right angles to the plane of the door and having an advance strike surface engageable with said keeper, a camming surface extending from said strike surface in a direction toward the outer side of the door when the latch is in its locked position and a latching surface engageable with said keeper to retain the door from outward movement relative to the door opening, a trigger pivoted for movement about an axis outside of the limits of said latch but within the extended margins thereof and parallel to the pivotal axis of the latch, said trigger serving as a hidden release for the latch and having a camming end depending from its pivot, a counterweight forming the upper end of said trigger and spaced along said latch from the pivotal axis of said trigger to a position above the pivotal axis of said latch and biasing the camming end of said trigger out of engagement with said latch, said latch having a portion at its rear end adapted to be engaaged by the camming end of said trigger, upon movement of said trigger about its axis toward the rear end portion of said latch, to raise said latch relative to said keeper and to release said latch from said keeper upon movement of the door in a direction to open the door, and a casing for said latch and trigger mounted on the door at an elevation closer to the top than the bottom of the door whereby the trigger cannot normally be reached except from an elevated platform, and preventing access to said counterweight except from the top thereof, said casing for said latch including parallel spaced plates, an inner plate of which is secured to the door, at least one spacer bar spacing said plates apart and preventing access to said latch from beneath the body of said latch, and a guard plate extending from the outermost of said plates upwardly along the outside of said trigger close to the upper end thereof.

4,598,942

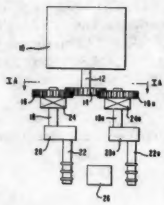
FORCE-CONTROLLED GRIPPER WITH ADAPTIVE ACCOMMODATION

Lanson Y. Shum, Silver Spring, Md., and Brian D. Ottinger, Penn Hills, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 23, 1984, Ser. No. 633,777

Int. Cl.[4] B25J *15/10*

U.S. Cl. 294—106 **8 Claims**



1. A gripper device for gripping an object, comprising:

motor means having a driving shaft rotatable in one and an opposite direction, said driving shaft carrying an output drive member;

a plurality of gripper assemblies adapted to be driven by said output drive member, each gripper assembly including a rotatable driven shaft having a lever fixed to and projecting transversely from said driven shaft and having gripper finger means projecting transversely at the distal portion of said lever;

coupling means between each said gripper assembly driven shaft and said output drive member; and

means for changing the torque transmitted from said output drive member through said coupling means to said gripper assembly driven shafts from a relatively low value at least until all of said gripper finger means have contacted said object, and thereafter to a relatively higher value at least adequate to permit handling the object without slipping.

4,598,943

VEHICLE SUN VISOR

Hans-Jürgen Scholz, Waldenbuch; Luigi Brambilla, Böblingen; Egon Katz, Nagold; Alban Bossenmaier, Stuttgart, and Gerhard Zweigart, Aidlingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 25, 1984, Ser. No. 664,753

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1983, 33 38 774

Int. Cl.[4] B60J *3/02*

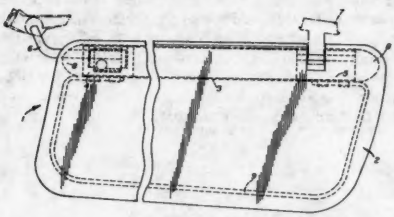
U.S. Cl. 296—97 H **7 Claims**

1. Sun visor arrangement for motor vehicles comprising:

a support tube extending over the major portion of the length of the sun visor configured to serve as an energy absorptive member,

cushioning material surrounding the support tube,

and bearing receptacle means at each end of the support tube for accomodating swivel bearing means and being connected with each other only by said energy absorptive support tube.



4,598,944

HAND GRIP CONTROLLED, USER ASSISTED RAISING CHAIR

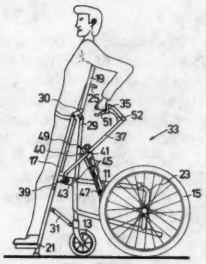
Bruno Meyer, Wohlen, and Peter Nold, Wettingen, both of Switzerland, assignors to Valutec AG, Dottikon, Switzerland

Filed Apr. 1, 1985, Ser. No. 718,079

Claims priority, application Switzerland, Apr. 6, 1984, 1744/84

Int. Cl.[4] A47C *4/52*

U.S. Cl. 297—183 **25 Claims**



1. Hand grip controlled raising chair having

a frame (11) having essentially parallel frame elements;

means (25) for maintaining said frame elements in selectively spaced positions, including a predetermined extended spacing;

a seat (17) located between the frame elements when the frame elements are located in said predetermined extended spacing and movable between an essentially horizontal, seating position and an essentially vertical, or raised position;

force applying means (27) for applying a raising force when the seat is moved between seating and raised position and for counteracting and supporting, at least in part, the weight of a user when the seat is moved between raised and seating position;

at least one hand grip (35) adapted for supporting a hand of the user to permit the user to brace her/himself upon transition between seated and erect position, and thereby assist the force of the force applying means (27);

and adjustment means (33) connecting the at least one hand grip to one of the frame elements

wherein, in accordance with the invention

the adjustment means (33) connecting the at least one hand grip to one of the frame elements comprises

a length-adjustable support element to permit the level of the position of the hand grip above a support surface for the raising chair to follow with the change in level of the user's hand upon transition between seated and erect position and to permit the user to brace her/himself on the hand grip regardless of the position of the user before, during and after said transition between seated and erect position.

4,598,945

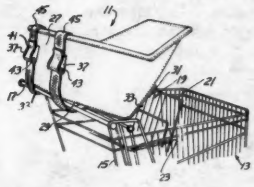
CHILD'S CAR SEAT WITH ATTACHMENT FOR SHOPPING CART

David Hopkins, 20038 Beaconsfield, Harper Woods, Mich. 48225

Filed Aug. 26, 1985, Ser. No. 769,349

Int. Cl.[4] A47C *1/11*

U.S. Cl. 280—250 **4 Claims**



1. A child's car seat including front, rear and bottom walls;

a pair of parallel laterally spaced flexible straps at their one end portions bearing against and secured to said rear wall;

said straps extending forwardly and intermediate their ends underlying and bearing against said bottom wall, and terminating in a pair of free end portions forwardly of said bottom wall;

a corresponding pair of laterally spaced strap anchors mounted upon and secured to said front wall, adapted to receive and adjustably grip the free end portions of said straps;

and a pair of laterally spaced snap fasteners mounted upon and secured to said rear wall adapted for connection to and interlock with a cross bar of a shopping cart;

said strap free end portions adapted to extend around and retainingly engage the handle of the shopping cart, said car seat spanning and supported upon the cross bar and handle.

4,598,946

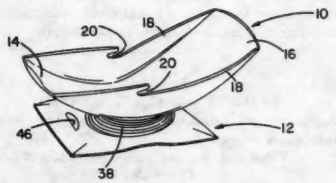
ROCKING INFANT SEAT

Richard E. Cone, Dayton, Ohio, assignor to Collier-Kenworth Company, Gardner, Mass.

Filed Jan. 2, 1985, Ser. No. 688,335

Int. Cl.[4] A47C *3/021*

U.S. Cl. 297—258 **11 Claims**



1. A rocking seat having an adjustable at-rest position comprising

a seat having a lower convexly arcuate support surface,

a base having a generally planar upper surface,

and means for securing said seat to said base with said support surface resting on said base surface to form an assembly, said means including a slot in said support surface, a

bolt extending through said slot, and means for releasably connecting said bolt to said seat and said base at any one of a plurality of at-rest positions in said slot, said assembly including yieldable means to permit said support surface to rock upon said base surface to and from its at-rest position.

4,598,947

DEVICE FOR ADJUSTING THE RELATIVE INCLINATION OF TWO ELEMENTS, AND IN PARTICULAR OF THE SEAT BASE AND SEAT BACK OF AN AUTOMOBILE SEAT

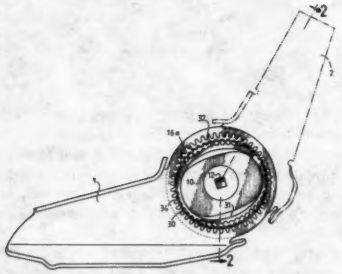
Francois Fourrey, Montbeliard, and Jean-Pierre Barnabe, Valentigney, both of France, assignors to Cycles Peugeot, Valentigney, France

Filed Oct. 23, 1984, Ser. No. 663,784

Claims priority, application France, Mar. 9, 1984, 84 03704

Int. Cl.[4] A47C *1/025*

U.S. Cl. 297—362 **6 Claims**



1. A device for adjusting the relative inclination of two elements, and in particular a seat back of an autombile seat relative to a base of the seat, said device comprising two toothed rings which have a common axis and identical inside diameters and different numbers of teeth, one of said rings being connected to one of said elements while the other of said rings is connected to the other of said elements, a cam having a substantially oval shape disposed within said toothed rings and rotatable about said common axis of the rings, and a flexible set of teeth formed by an evenly corrugated metal band which is interposed between the cam and the rings and is capable of being urged into engagement with the teeth of said rings by two diametrically opposed portions of the cam so as to rotate a movable ring of said rings upon rotation of said cam, said device further comprising interposed between the cam and flexible set of teeth a ring of a flexible material which has a smooth surface in facing relation to and in contact with the cam and a set of teeth in facing relation to the corrugated metal band and in releasable engagement with said flexible set of teeth on an inner side of said metal band in the region of said two diametrically opposed portions of the cam.

4,598,948

VEHICLE ARMREST SUPPORT

Carl W. Flowerday, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Oct. 21, 1983, Ser. No. 544,121

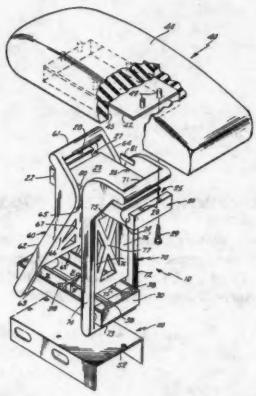
Int. Cl.[4] A47C *7/54*

U.S. Cl. 297—411 **1 Claim**

1. A vehicle armrest assembly comprising:

upper and lower mounting brackets each including a pair of spaced sockets extending in parallel relationship to each other; and

a pair of substantially identical support members each formed of two spaced L-shaped members, each L-shaped member formed of an elongated leg extending upwardly and a shorter leg extending laterally from the upper end of said upwardly extending leg, said L-shaped members being integrally coupled to each other by pivot rods extending between said L-shaped members at the upper and lower ends thereof, said L-shaped members adapted to be coupled to said mounting brackets with said pivot rods pivotally fitted in said sockets of said brackets, said shorter legs of the L-shaped members of one support member facing away from the shorter legs of the L-shaped members of the other support member;



said L-shaped legs of each support member, having support frame members extending therebetween and forming a cross arm with a contact surface located adjacent the intersection of said legs; a stop member on each support member located above said contact surface and extending away from the support member on which it is located and toward said other support member for engaging the contact surface of said support member; and

an armrest pad secured to an upper side of said upper mounting bracket.

4,598,949

SEATING PLATFORM

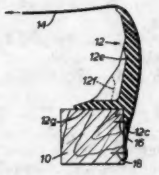
James P. Miln, Repton, England, assignor to Pirelli Limited, London, England

Filed Nov. 15, 1984, Ser. No. 671,510

Claims priority, application United Kingdom, May 10, 1984, 8412005; Aug. 1, 1984, 8419627

Int. Cl.[4] A47C *7/02*

U.S. Cl. 297—452 **9 Claims**



1. A seating platform comprising an elongate elastic element formed from a substantially incompressible material and disposed along at least one frame member of a seat, and a sheet of non-stretch material secured along opposite edges thereof to said one frame member and an opposite frame member so as to be taut when the seat is not loaded, said sheet lying over said elongate elastic element and the arrangement being such that upon loading the seat, tension thus imparted to said sheet

produces elastic deformation of said elongate element, the elongate elastic element being provided with recessed regions into which the said substantially incompressible material can deform and expand along the lengthwise axis of the element to compensate for compression of the element along axes transverse to its length, so as to permit limited depression of the platform over its loaded region.

4,598,950

TUBULAR REINFORCEMENT IN PARTICULAR FOR A MOTOR VEHICLE SEAT

Francois Fourrey, Montbeliard, France, assignor to Cycles Peugeot, Valentigney, France

Filed Feb. 29, 1984, Ser. No. 584,563

Claims priority, application France, Mar. 1, 1983, 83 03340

Int. Cl.⁴ B60R *21/00*

U.S. Cl. 297—452 **5 Claims**

1. A reinforcement, in particular for a motor vehicle seat, said reinforcement comprising an assembly of tubes defining an interior part of the reinforcement and, in a tube portion of said tubes which is exposed to impacts, means for rendering said tube portion more deformable in cross section when subjected to impact in a direction substantially toward said interior part of the reinforcement, said means consisting of at least one elongated, narrow and empty slit provided in a wall of said tube portion, extending longitudinally of said tube portion and facing said interior part of the reinforcement.

4,598,951

ADJUSTABLE ANCHOR MOUNTING DEVICE

Katsuyasu Ono, Fujisawa, Japan, assignor to NSK-Warner K.K., Japan

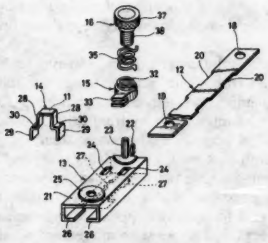
Filed Sep. 15, 1983, Ser. No. 532,405

Claims priority, application Japan, Sep. 24, 1982, 57-144424[U]; May 30, 1983, 58-95432

The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.

Int. Cl.⁴ A62B *35/02*; B60R *21/10*

U.S. Cl. 297—483 **15 Claims**



1. An adjustable anchor mounting device comprising:

a substantially planar base to be mounted fixedly on a vehicle body and having a plurality of interlocking means provided spacedly along the direction of displacement of an anchor;

a slide member guided along the base, carrying the anchor thereon and formed substantially into a C-like configuration as seen in a transverse cross-section so as to surround the base;

a latch piece provided with the slide member, said slide member being slidably displaceable between a first position where the latch piece is in engagement with either one of the interlocking means and a second position where the latch piece is out of engagement with any of the interlocking means, said latch piece having a pair of neck portions engageable with either one of the interlocking means and a top portion connecting the neck portions together thereby forming a substantially U-shape as seen in a transverse cross-section thereof; and rigid locking means provided between the latch piece and slide member for normally inhibiting the latch piece assuming the first position from moving to the second position.

4,598,952

DEVICE FOR MOUNTING OBJECTS INTENDED FOR ATTACHMENT TO RIMS OF VEHICLE WHEELS

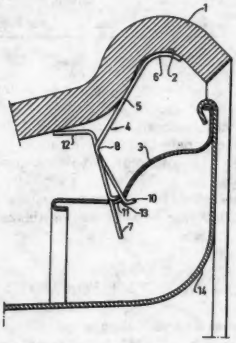
Krister Arvidsson, Eskilstuna, Sweden, assignor to AG Segerstrom och Svensson, Eskilstuna, Sweden

Filed Mar. 7, 1985, Ser. No. 709,377

Claims priority, application Sweden, Mar. 12, 1984, 8401362

Int. Cl.⁴ B60B *23/06*

U.S. Cl. 301—37 C **6 Claims**



1. A device for mounting of objects to be carried by vehicle wheel rims, which rims have a peripheral recess open radially inwards, said device comprising a ring and a plurality of clamp means spaced around the ring, each clamp means having an inner end portion pivotally mounted on the ring at a hinge location so that the clamp means can swing toward and away from the wheel rim and a free end outside the ring, a support portion of each clamp means extending axially inwards towards the wheel and arranged between the ring and the free end, said support portion forming a stop for the pivotal motion of the clamp means upon engagement of the free end in the recess and after the ring has been pressed axially inwards towards the wheel.

4,598,953

ELECTROPNEUMATIC BRAKE CONTROL SYSTEM FOR RAILWAY TRANSIT VEHICLE

James A. Wood, McKeesport, and Richard J. Mazur, Pittsburgh, both of Pa., assignors to American Standard Inc., Wilmerding, Pa.

Filed Jun. 17, 1985, Ser. No. 745,479

Int. Cl.⁴ B60T *8/02, 8/58, 13/74*

U.S. Cl. 303—3 **31 Claims**

1. For a railway vehicle having a brake command signal, a dynamic brake feedback signal, brake means for providing friction braking, a friction brake feedback signal, and a first source of fluid under pressure, an electropneumatic braking system comprising:

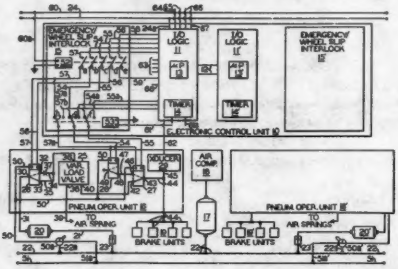
(a) an electronic control unit operative in response to changes in said brake command signal, said dynamic brake

feedback signal, and said friction brake feedback signal to provide first and second friction brake signals;

(b) electropneumatic valve means for selectively controlling said brake means in response to said first and second friction brake signals to effect the application and release of friction braking of said vehicle;

(c) a first flow path via which said source of fluid pressure is communicated with said electropneumatic valve means;

(d) a second flow path communicating said electropneumatic valve means to atmosphere;



(e) said electropneumatic valve means being located between said brake means and said first and second flow paths, so that in response to one of said first and second friction brake signals, said brake means is pressurized, and in response to the other of said first and second friction brake signals, said brake means is vented; and

(f) choke means in one of said first and second flow paths for providing a fast-rate flow restriction thereat.

4,598,954

DUAL BRAKING DEVICE FOR MOTORCYCLE

Tsutomu Hayashi, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

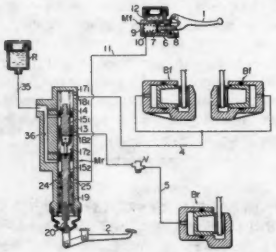
Filed Sep. 13, 1982, Ser. No. 417,093

Claims priority, application Japan, Sep. 19, 1981, 56-148193

The portion of the term of this patent subsequent to Aug. 14, 2001, has been disclaimed.

Int. Cl.[4] B60T *13/00*; F16D *65/32*

U.S. Cl. 303—6 A **1 Claim**



1. A braking device for a motorcycle having both a front wheel brake and a rear wheel brake, comprising

a main oil pressure generator including a first pressurized oil output means for operating the front wheel brake and having a first chamber, a first piston for pressurizing oil in said first chamber and a restraining means resisting movement of said first piston in said first chamber and a second pressurized oil output means for operating the rear wheel brake and said first piston and having a second chamber and a second piston for pressurizing oil in said second chamber, said first piston forming a wall of said second chamber such that pressurization of said first chamber is resisted by said resisting means below a preselected pressure in said second chamber,

a hand actuated brake lever including a remote oil pressure generator means providing input pressurized oil to said second piston to operate in series initially said second piston and then said first piston, and

a foot actuated brake pedal mechanically linked to said second piston to operate in series initially said second piston and then said first piston.

4,598,955

SLIP CONTROL SYSTEM MASTER CYLINDER WITH PISTON SLEEVE

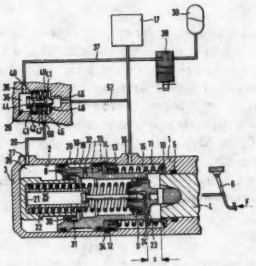
Juan Belart, Walldorf, and Jochen Burgdorf, Offenbach-Rumpenheim, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jul. 13, 1984, Ser. No. 630,497

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1983, 3325424

Int. Cl.[4] B60T *8/44, 11/20, 13/58*; F15B *7/00*

U.S. Cl. 303—114 **9 Claims**



2. An actuating device for use in a master cylinder of the type including at least one piston means positionable in response to movement of a brake pedal for pressurizing hydraulic brake fluid in a hydraulic brake system having slip control, including means for supplying auxiliary pressurized hydraulic brake fluid into said master cylinder for replenishing said brake fluid in said brake system and for resetting the position of said piston means during operation of said slip control system comprising:

a housing defining a portion of said master cylinder including a bore therein closed on one end and open at a second end;

a generally tubular positioning sleeve sealingly, slidably mounted within said bore defining at a first annular pressure chamber between said positioning sleeve and said housing adapted to be hydraulically connected to at least one wheel brake of said brake system;

a first piston part sealingly, slidably mounted in said tubular positioning sleeve proximate said open end and including means providing for operatively connecting said first piston part to said brake pedal for movement in an actuating direction in response to movement of said brake pedal;

a generally cylindrical stationary second piston part affixed to said closed end extending coaxially, partially into said positioning sleeve, said positioning sleeve being sealingly, slidably supported by said stationary piston part, said stationary piston part, an end of said positioning sleeve and said housing defining an auxiliary pressure chamber, said auxiliary pressure chamber adapted to receive said auxiliary pressurized fluid, said positioning sleeve, said stationary piston part and said first piston part defining a working chamber having a variable volume and being in flow communication with said first annular chamber;

means for interconnecting said positioning sleeve to said first piston part at a predetermined position of said first piston part for movement therewith in the actuating direction; and

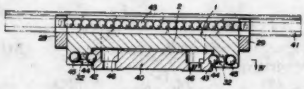
one-way valve means associated with said positioning sleeve interconnecting said auxiliary pressure chamber to said working chamber providing for flow of said auxiliary fluid into said working chamber.

4,598,956

CROSS-LINEAR SLIDE BEARING UNIT

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-Ku, Tokyo, Japan

Filed Aug. 28, 1984, Ser. No. 644,985
Int. Cl.⁴ F16C *29/06*
U.S. Cl. 384—45 **4 Claims**



1. A cross-linear slide bearing unit comprising:

first and second track rails, each formed of a longitudinally extending elongated plate of substantially rectangular cross-section, said track rails being disposed in vertically spaced and crossing relation to each other and each track rail provided at opposite sides thereof with a pair of loaded ball grooves, respectively;

a bearing body formed of a substantially flat plate-like block of a small thickness having two opposed flat surfaces, said bearing body being provided at one flat surface thereof with a first shallow rectilinear recess of rectangular cross-section into which said first track rail is slidably fit, and at the other flat surface thereof with a second shallow rectilinear recess of rectangular cross-section which is in crossing relation to said first recess, and into which said second track rail is slidably fit, said bearing body being provided at opposite sides of said first recess with a pair of loaded ball guide grooves respectively facing said loaded ball grooves in said first track rail, and at opposite sides of said second recess with a pair of loaded ball guide grooves respectively facing said loaded ball grooves in said second track rail, said bearing body further having a pair of first non-loaded ball guide bores, each formed therethrough in parallel relation to the corresponding first loaded ball guide grooves in said bearing body, and a pair of second non-loaded ball guide bores, each formed therethrough in parallel relation to the corresponding second loaded ball guide grooves in said bearing body; and

four end plates respectively mounted to four sides of said bearing body, each end plate having an inner surface with a ball guiding U-groove for providing communication between said non-loaded ball guide bores and the corresponding loaded ball guide grooves.

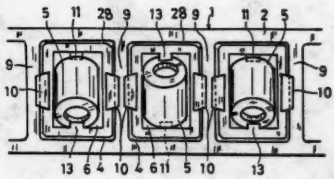
4,598,957

ROLLING BODY FITTED TO A HOLDER

Kiyomi Shibayama, Gumma, Japan, assignor to NSK Torrington Company, Ltd., Tokyo, Japan

Filed Nov. 1, 1983, Ser. No. 547,746
Claims priority, application Japan, Nov. 20, 1982, 57-176405
Int. Cl.⁴ F16C *29/04*
U.S. Cl. 384—51 **5 Claims**

1. A linear roller bearing assembly comprising an elongated base plate having a plurality of pockets spaced along the length thereof, a roller holder removably mounted in each pocket with clearance between the outer peripheral edge of said holder and the inner peripheral edge of said pocket so that said holder is movable within said clearance, and a roller body located in each holder, each of said holders comprising a frame, conforming in outer peripheral shape to that of said pocket, said frame having two pair of tabs extending outwardly on opposite sides thereof, said tabs being adapted to be snapped on to the corresponding peripheral edges of said base plate in opposition to said sides when said holders are located



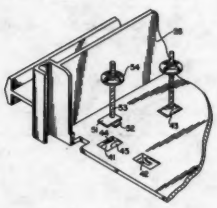
in said pockets and means for retaining said respective roller bodies in said holders comprising a pawl extending inwardly from opposite lateral sides of said frame in engagement with respective frontal ends of said roller bodies wherein said opposing pawls have sloping walls inclined with respect to each other in opposite directions to hold said roller bodies at an angle along an axis inclined with respect to said base plate.

4,598,958

PULL-OUT DRAWER FOR A FILING CASE

Johannes M. Verholt, Ulft, Netherlands, assignor to B.V. Briefhouder- en Papierwarenfabriek PAS, Netherlands

Filed Jul. 25, 1984, Ser. No. 634,389
Int. Cl.⁴ A47B *63/00*
U.S. Cl. 312—189 **3 Claims**



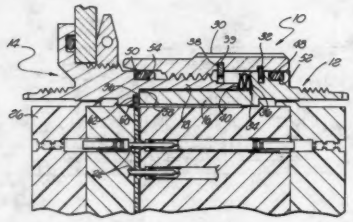
1. A pull-out drawer for a filing case the drawer being slidably mounted in the case, said pull-out drawer comprising a bottom platform and a front panel rigidly connected thereto, said front panel having a handle projecting from its front face, said drawer characterized in that a plurality of elongated apertures are provided in said platform adjacent said front panel, said apertures being both arranged and elongated parallel to said front panel, each of said apertures having mounted therein a pair of wing means extending a portion of the length of the aperture and laterally into the aperture a portion of its width to form a slot both shorter and narrower than the aperture; threaded posts each having at its lower end a resilient foot piece of the same size as the aperture to seat in and close the top of one of the apertures; means on each post below said foot piece forming a channel element adapted to be moved lengthwise of said slot to engage said wing means to secure the post to the platform; the foot piece resiliently entering the aperture when the post is properly positioned for locking the post in place.

4,598,959

ELECTRICAL CONNECTOR GROUNDING RING

Gerald J. Selvin, Huntington Beach, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 4, 1983, Ser. No. 548,797
Int. Cl.[4] H01R *4/66, 13/648*
U.S. Cl. 339—14 R **9 Claims**



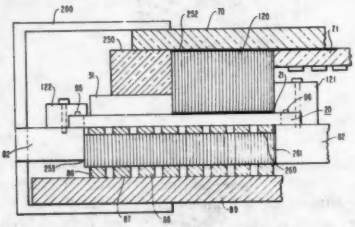
1. An electrical connector comprising:
first and second mating connector members each including a conductive shell;
said shells having forwardly facing annular surfaces thereon;
a conductive bellows positioned between said surfaces providing a grounding connection between said shells;
said bellows having rounded folds that cause opposite sides of a fold to remain spaced apart by more than two adjacent locations of the bellows that are near different folds; and
said bellows being axially compressed when said connector members are mated.

4,598,960

METHODS AND APPARATUS FOR CONNECTING CLOSELY SPACED LARGE CONDUCTOR ARRAYS EMPLOYING MULTI-CONDUCTOR CARRIER BOARDS

Frank J. DiSanto, North Hills, and Denis A. Krusos, Lloyd Harbor, both of N.Y., assignors to Copytele, Inc., Huntington Station, N.Y.

Filed Apr. 29, 1985, Ser. No. 728,602
Int. Cl.[4] H01R *9/09*
U.S. Cl. 339—17 M **20 Claims**



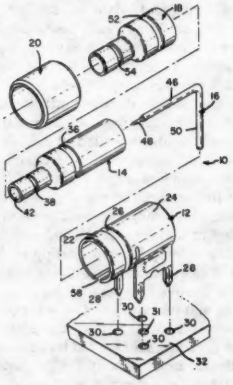
15. Apparatus for connecting to a plurality of closely spaced conductive lines of the type located on a panel with said lines being parallel to one another and closely stacked in a parallel array from a first line to a last line from one side to another side of said panel, comprising in combination therewith,
a base plate having a larger area than said panel with said panel positioned in the center of said base plate with said line pattern facing said base plate to allow said plate to frame said panel about the sides thereof, said base plate having a first and a second row of extending pins along one side, with said first row of pins positioned beneath said panel and with said second row spaced from said first row, whereby each pin in said first row is on a common line with a pin in said second row with said common line being parallel to said panel lines,
separate carrier boards each having first and second sides with each side having a datum aperture each coacting with a pin of the first row and a pin of the second row to position each board parallel to said common line, each carrier board having a group of conductive lines on a top surface with said lines aligned parallel to said common line between said pins,
a conductive strip positioned between said panel and the top surfaces of said carrier boards,
and pressure exerting means coupling said base plate to said panel to force the two together to assure contact via said conductive strip between said panel lines and said carrier board lines.

4,598,961

COAXIAL JACK CONNECTOR

Thomas S. Cohen, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 538,450, Oct. 3, 1983, abandoned. This application Sep. 30, 1985, Ser. No. 781,325
Int. Cl.[4] H05K *1/00*
U.S. Cl. 339—17 C **15 Claims**



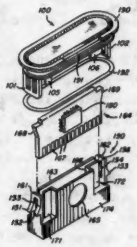
1. A coaxial connector, comprising a conductive body member formed with a U-shaped section having an open side, and formed with a tubular section having an opening in communication with the open side, and formed with conductive terminal sections projecting from the U-shaped section for connection to ground electrical potential, a dielectric body member in the U-shaped section and projecting through the tubular section and protruding from the conductive body member, a conductive center contact member projecting axially of the dielectric body member and through the tubular section for connection with a further electrical connector, a terminal section of the center contact member projecting from the dielectric body member and through the open side of the conductive body member for connection to a source of electrical signal, a conductive outer contact member encircling the protruding dielectric body member and extending into the tubular section, a conductive ferrule in crimped engagement on the tubular section and covering the opening of the tubular section, a dielectric opening in the junction of a side and an end of the dielectric body member and in communication with the bore in the dielectric body member, and the terminal section of the center contact member projecting from the dielectric opening and through the side of the dielectric body member.

4,598,962

MEMORY DEVICE RETAINING APPARATUS FOR PORTABLE DATA PROCESSOR

Christopher J. Reitz, Davie, Fla., and Jeffery C. Barrus, Houston, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 14, 1984, Ser. No. 589,291
Int. Cl.[4] H01R 9/09
U.S. Cl. 339—17 L 8 Claims



1. Apparatus for retaining a memory device adapted to be plugged into data processing means, said apparatus comprising:

a cover having first and second ends and first and second elongated sides adapted to insert into the data processing means, said cover including first and second guides oppositely located at said first and second ends of the cover, respectively, each guide having an elongated slot, and said cover further having a third guide located at the first side and fourth and fifth guides having different shapes and located at the second side; and

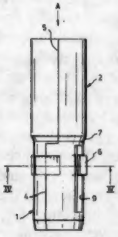
a retaining device mechanically coupled to said cover for retaining the memory device therein, said retaining device having a base, first and second posts and first, second and third slots, said first and second posts each having a tang for engaging the elongated slot of the first and second guides of the cover, respectively, whereby said cover acts as an extendible handle, and said first, second and third slots of the retaining device engaging the third, fourth and fifth guides of the cover, respectively whereby said retaining device is oriented and held by said cover.

4,598,963

CIRCUIT BOARD COMPOSITE CONNECTOR

Cyril J. White, Chandlers Ford, and Christopher Joyce, Southampton, both of England, assignors to BICC Public Limited Company, London, England

Filed Nov. 4, 1983, Ser. No. 548,739
Claims priority, application United Kingdom, Nov. 5, 1982, 8231713; Dec. 7, 1982, 8234858
Int. Cl.[4] H01R 11/20, 11/22
U.S. Cl. 339—17 C 12 Claims



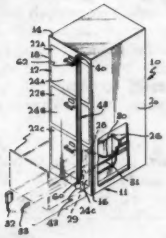
1. For use with a circuit board of the kind comprising a board of electrically insulating material, a regular pattern of strips of electrically conductive metal or metal alloy bonded on one surface of the board and, extending through the board and the overlying electrically conductive metal strips, a multiplicity of holes distributed at spaced positions along the strips, a composite connector formed from a preform of electrically conductive sheet metal or metal alloy which is folded to form a tube having a seam defined by longitudinally extending free edges of the preform and extending from end to end of the composite connector and which is shaped to form, at one end of the composite connector, a socket of substantially circular cross-section which will make a fit in a hole in the circuit board and in which a terminal pin of a circuit component can be resiliently gripped and, at the other end of the composite connector, a tubular end portion of substantially circular cross-section having longitudinally extending slots which are at substantially diametrically opposed positions and whose axes lie in a plane transverse to the plane common to the axes of the composite connector and of said seam, each of which slots opens into that end of the composite connector and is bounded by marginal portions of said tubular end portion, which marginal portions and the slot bounded thereby constitute the limbs and an insulated wire-receiving opening of a bifurcated contact, the arrangement being such that, when a length of insulated wire is introduced into the opening between the limbs of each bifurcated contact, the limbs will displace the insulating covering of the wire to effect an electrical connection with the wire at at least tow positions spaced along its length, wherein parts of said longitudinally extending free edges defining the seam in the socket are circumferentially spaced with respect to parts of said longitudinally extending free edges defining the seam in the tubular end portion, whereby the thickness of the preform is such that the wall thickness of the socket and the wall thickness of the tubular end portion are substantially equal, and wherein the socket has, integral with that part of the preform forming the socket, resilient contact means for effecting electrical contact with a terminal pin of a circuit component, said integral resilient contact means being circumferentially spaced with respect to said slots.

4,598,964

SYSTEM FOR SECURING DATA WITHIN A COMPUTER

Attila Frink, Northridge, and Robert A. Morrison, Long Beach, both of Calif., assignors to Lockheed Corporation, Burbank, Calif.

Filed Dec. 14, 1984, Ser. No. 681,464
Int. Cl.[4] H01R 13/44
U.S. Cl. 339—37 9 Claims



1. A system for securing data stored within a computer comprising:

a cabinet having an interior portion adapted to hold that part of the computer containing the data to be secured therein;

electrical connector means coupled to said cabinet adapted to electrically couple the part of the computer to the exterior of said cabinet; and

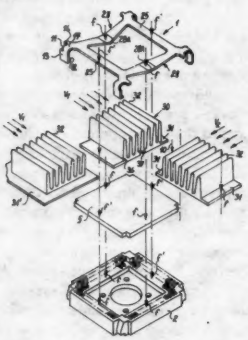
securing means adapted to prevent access to said electrical connector means from the exterior of said cabinet.

4,598,965

CONNECTOR AND CLOSURE CLIP FOR A RECTANGULAR CIRCUIT SUPPORT

Hervé Bricaud, Plaisir; Jean C. Rouffy, Poissy, and Patrick L'Henaff, Thiais, all of France, assignors to Socapex, Sureness, France

Filed Nov. 7, 1984, Ser. No. 668,959
Claims priority, application France, Nov. 10, 1983, 83 17912
Int. Cl.[4] H01R 9/09
U.S. Cl. 339—75 MP **9 Claims**



1. A connector for a chip carrier comprising: a rectangular base having four corners with a clip housing disposed at each of said four corners, said base being adapted to contact a chip carrier having first and second faces, with electrical contact zones disposed on at least one of said faces, said base having flexible contacts which are adapted to receive corresponding contact zones on the first face of said chip carrier; and

a clip adapted to bear on the second face of said chip carrier so as to maintain electric continuity between said contact zones and said flexible contacts, said clip including

a rectangular frame having four corners, said frame being substantially in one plane when said clip bears on said chip carrier, said frame having two cross arms forming opposite sides of said rectangular frame, said frame having at least two bearing arms forming opposite sides of said rectangular frame, being connected together by said cross arms, each of said bearing arms including a bearing zone substantially in the middle thereof and two symmetrical half arms connecting to said bearing zone, each of said half arms generally widening in the vicinity of said bearing zone, so as to impart substantially equal resistance to bending along each half arm, each pair of half arms forming an angle out of said plane of said frame when said clip is not bearing on said chip carrier, said bearing zone being disposed at the vertex of said angle and oriented to compressibly contact said chip carrier when said clip is bearing on said chip carrier, and

hooks for removably fixing said clip to said rectangular base, one of said hooks being disposed at each of said four corners of said rectangular frame to correspondingly engage each of said clip housings of said base.

4,598,966

NON-SHORTING PIN SYSTEM

Lawrence J. Boland, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, N.Y.

Filed Mar. 3, 1983, Ser. No. 471,955
Int. Cl.[4] H01R 9/09
U.S. Cl. 339—75 MP **1 Claim**

1. In a zero insertion force type electrical connector for receiving an electrical component having a plurality of rows of contact pads disposed on opposite sides of a flat surface thereof, said contact pads including a first row of pads on a given side of said electrical component offset and interleaved with respect to pads in an adjacent second row and on the same side of said electrical component, insulating gaps separating said pads in said first row narrower than the width of the contacting region of said pads in said second row to provide a high density contact pad pattern, an electrical connector comprising:

a housing of electrically insulating material having a base and two side walls together defining an elongated opening at the top of said housing for receiving therein said electrical component;

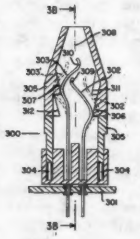
upper inclined surfaces on the inside of each side wall of said housing facing the elongated opening in said housing;

lower inclined surfaces on the inside of each side wall of said housing facing the elongated opening in said housing;

a first row of spring-like contact pins having alternating long and short pins on one side of said elongated opening;

a second row of spring-like contact pins having alternating long and short pins on the other side of said elongated opening in staggered relation to said first row of contact pins wherein the long pins of said first row are opposite said short pins of said second row and the short pins of said first row are opposite said long pins of said second row;

contact regions of said short contact pins for contacting the interleaved contact pads located in the row of pads nearest to the edge of the electrical component,



contact regions of said long contact pins for contacting the interleaved contact pads located in the row of pads farthest from the edge of the electrical component;

actuating means for moving said housing in a vertical plane wherein said lower inclined surfaces urge said short contact pins and said upper inclined surfaces urge said long contact pins in a direction toward the center of said elongated opening;

said contact regions of said short pins passing through said centerline of said elongated opening wherein the contact region of each short pin is below said contact region of said opposite long pin thereby precluding opposite facing contact pins from contacting and short circuiting when the contact pins are actuated in the absence of an electrical component within the connector, and

said contact regions of said long pins passing through said centerline of said elongated opening wherein the contact region of each long pin is above said contact region of said opposite short pin thereby precluding opposite facing contact pins from contacting and short circuiting when the contact pins are actuated in the absence of an electrical component within the connector;

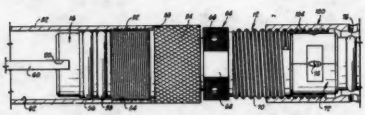
upon insertion of an electrical component vertically into said elongated opening of said housing through a vertical plane oriented substantially parallel with the longitudinal dimension of said elongated opening, electrical connection is completed.

4,598,967

QUICK CHANGE COUPLING

Billy W. White, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jun. 26, 1984, Ser. No. 624,877
Int. Cl.[4] H01R *13/62*
U.S. Cl. 339—89 R 9 Claims



1. A quick change coupling for a downhole tool, comprising:
male coupling component means;
female coupling component means including coupling body means having coupling sleeve means extending coaxially therefrom, said coupling sleeve means adapted to receive a portion of said male coupling component means therein;
seal means between said male coupling component means and said female coupling component means;
pin body means associated with one of said coupling component means and having a plurality of electrical connector pins extending longitudinally therefrom;
socket body means associated with the other of said coupling component means and having a plurality of electrical connector sockets therein adapted to engage said pins;
alignment means adapted to align said pins with said sockets;
thread means adapted to secure said coupling components together;
body sleeve means disposed within said coupling body means and adapted to hold one of said pin and socket body means;
resilient biasing means associated with at least one of said pin and socket body means and adapted to longitudinally bias said at least one pin or socket body means held by said body sleeve means toward the other of said pin or socket body means and said coupling sleeve means;
substantially tubular stabilizer means fixedly secured inside said coupling body means, said body sleeve means being disposed within said stabilizer means; and
guide means adapted to prevent relative rotation between said body sleeve means and said coupling body means, said guide means comprising a longitudinally extending slot in the wall of said stabilizer means and a radially extending pin protruding through said slot from said body sleeve means.

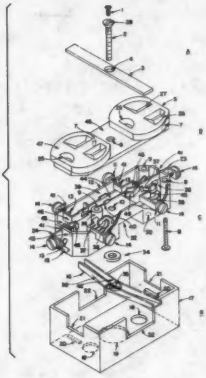
4,598,968

ELECTRICAL RECEPTACLE UNIT

Theron Long, 228 Hargrave Rd., Toledo, Ohio 43615

Filed Aug. 13, 1981, Ser. No. 292,591
Int. Cl.[4] H01R *13/74*
U.S. Cl. 339—126 R 5 Claims

1. An electrical receptacle unit comprising an electrical receptacle having a reduced thickness section intermediate two plug receiving stations, said reduced thickness section having a bore there through, a toggle bolt comprising a head, a shaft, and wings mounted on said shaft, the shaft thereof extending through said bore, a metal bar positioned on said shaft intermediate the head of the toggle bolt and the front surface of said reduced thickness section, whereby when said toggle bolt is tightened, said metal bar abuts the front surface of adjacent wall sections and the wings of said toggle bolt



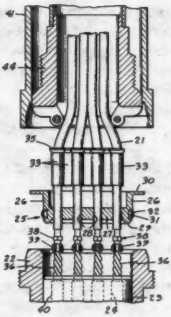
expand and abut the rear surface of adjacent wall sections, thereby securing said electrical receptacle unit tightly in place.

4,598,969

TERMINATION MEANS

Roger C. Stephenson, Woodland Hills, Calif., assignor to Automation Industries, Inc., Greenwich, Conn.

Filed Dec. 12, 1984, Ser. No. 680,920
Int. Cl.[4] H01R *13/46*
U.S. Cl. 339—143 R 3 Claims



1. Means for effecting electrical termination of a cable wire shield to an open-ended conductive shell, comprising:
plate means for receipt within the shell open end, said plate means having an opening therein, a peripheral recess and an integral flange facing the shell open end;
means threaded onto the shell open end for securing the plate means flange against the shell end;
spring ring means located within the plate means recess for conductively interrelating the plate means to the shell spring means including a leaf spring having a curved cross-section with a convex portion thereof contacting the inner wall of the shell;
a conductive tube having a bore therethrough and an end conductively secured to the plate means by a weldment with the tube bore aligned with the opening in the plate means, the other end of the tube being flared outwardly; and
leaf spring contact electrode means for being carried by the

cable wire and electrically interconnecting the cable wire shield to the inner wall of the conductive tube.

4,598,970

INTERNALLY SPLIT TYPE JACK

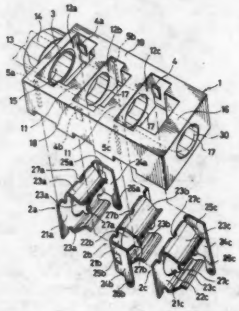
Yukio Takihara, Osaka, Japan, assignor to Hosiden Electronics Co., Ltd., Japan

Filed Mar. 2, 1984, Ser. No. 585,779

Claims priority, application Japan, Mar. 10, 1983, 58-35893[U]; Mar. 10, 1983, 58-35894[U]

Int. Cl.[4] H01R *17/18*

U.S. Cl. 339—183 7 Claims



1. An internally split type jack, comprising:

a casing, the casing having a front end wall formed with a plug inlet hole and partition walls having plug passage holes formed therein aligned coaxially with the plug inlet hole and of substantially corresponding diameter, an inner casing wall of each housing space having formed therein a slot closed at one end;

a plurality of electrical contact pieces mounted one in each of the housing spaces, each of the contact pieces comprising;

a main body with a further plug passage hole therein substantially corresponding in diameter to the plug inlet hole;

cooperating resilient contact-makers disposed on opposite sides of the further plug passage hole; and,

a side edge adapted to slidably engage in the slot and so properly position the contact piece in the housing space to align the further plug passage hole coaxially with the plug inlet hole and the plug passage holes;

a bottom wall for the casing, the bottom wall having openings therein for receiving the contact pieces, the slots each having an open end at the bottom wall communicating with one of the openings, whereby the contact pieces may be slidably inserted into the housing spaces through the openings, being guided into and held in position by the slots, the closed end of each slot preventing movement of each contact piece beyond the position of coaxial alignment; and,

at least one abutment disposed in at least one of the housing spaces to limit outward movement of at least one of the resilient contact-makers, whereby a plug inserted into and withdrawn from the jack will be guided during movement by the plug inlet hole and the plug passage holes, thereby passing smoothly through the further plug passage holes in the contact pieces, and will be resiliently clamped between the contact-makers of each contact piece during full insertion, the contact pieces being protected from damage due to misaligned movement of the plug into and out of the jack.

4,598,971

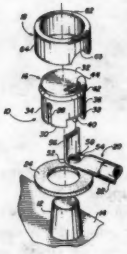
BATTERY CABLE/CONNECTOR ASSEMBLY

C. Richard Goodman, Glendale, Ariz., assignor to Raymond A. Dufresne; Terry R. Eberts; Matthew L. Ajeman and Herbert E. Haynes, Jr., all of Phoenix, Ariz.

Filed Apr. 1, 1985, Ser. No. 718,561

Int. Cl.[4] H01R *11/26*

U.S. Cl. 339—228 15 Claims



1. A battery cable/connector assembly for mounting on a terminal post of an electric storage battery, said battery cable/-connector assembly comprising:

(a) a battery cable having electrically conductive strands extending from one end thereof;

(b) a lug of electrically conductive metal encasingly fixed on the extending strands of said battery cable in electrically conductive contact therewith, said lug having an axial extending strand encasing portion and a flattened contact portion which extends angularly from the strand encasing portion;

(c) clamping cap means of inert dielectric resiliently deformable material and having a blind bore formed axially therein;

(d) said contact portion of said lug being disposed axially in the blind bore of said clamping cap means with the blind bore being sized to axially receive the terminal post of the storage battery in an interference fit manner so that said clamping cap means will provide a pressurized electrically conductive contact between the contact portion of said lug and the terminal post of the storage battery when the terminal post is received therein; and

(d) retainer ring means demountably mountable on the periphery of said clamping cap means to surroundingly retain said clamping cap means in place when the terminal post of the storage battery is received in the blind bore thereof.

4,598,972

HIGH DENSITY ELECTRICAL LEAD

William B. Mullen, III, Boca Raton, and Glenn F. Urbish, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 402,467, Jul. 28, 1982, abandoned. This application Jan. 7, 1985, Ser. No. 689,493

Int. Cl.[4] H01R *11/22*

U.S. Cl. 339—258 R 2 Claims

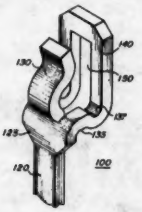
1. A clip-on type electrical lead for use in conjunction with a planar substrate of predetermined thickness, said electrical lead comprising:

an elongated shaft suitable for electrical connection;

a front spring finger extending from one end of said elongated shaft, operative in substantially the same plane as said elongated shaft;

a substantially flat rear bracing member, positioned parallel to but displaced behind the operative plane of said front spring finger, said rear bracing member having two legs joined by a top connection and having an aperture interior to said legs and said top connection, whereby the top

connection increases the structural strength of the legs permitting the legs to be narrower than they would be without the top connection, thereby conserving substrate real estate when the lead is attached to the substrate, whereby the top connection increases the pull strength of the lead when the lead is soldered to the substrate, and whereby the substantially flat rear bracing member minimizes the protrusion of the lead from the rear surface of the substrate when the lead is attached to the substrate; and



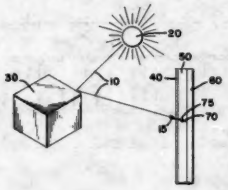
support means for supporting said rear bracing member to said elongated shaft, said support means being appropriately dimensioned to fix the displacement of said rear bracing member from the operative plane of said front spring finger to permit insertion of said substrate between said front spring finger and said rear bracing member so that said electrical lead and said substrate are held in engagement by spring force from said front spring finger, and said support means has a downward detent at its junction with said rear bracing member, thereby permitting the substrate to seat against the support means when the lead is attached to the substrate.

4,598,973

APPARATUS AND METHOD FOR RECORDING AND DISPLAYING A THREE-DIMENSIONAL IMAGE

James F. Greenleaf, 1068 Plummer La., Rochester, Minn. 55901

Filed Mar. 7, 1984, Ser. No. 587,270
Int. Cl.⁴ G03H *1/06*
U.S. Cl. 350—3.6 **15 Claims**



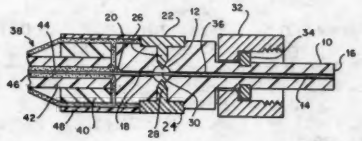
1. An apparatus for recording a three-dimensional image of an object illuminated by a light source, comprising:
(a) a housing having a front end and a back end;
(b) an emulsion;
(c) phase-conjugate mirror means for reflecting light directly back on its original path of incidence, said emulsion and said phase-conjugate mirror means supported within said housing, said emulsion being juxtaposed with said phase-conjugate mirror means, and being positioned in front of said phase-conjugate mirror means between the front end of said housing and said phase-conjugate mirror means;
(d) means for retaining said emulsion in contact with said phase-conjugate mirror means; and
(e) shutter means positioned proximate the front end of said housing for exposing said emulsion to the illuminated object for a predetermined period of time.

4,598,974

OPTICAL FIBER CONNECTOR HAVING INTEGRAL ELECTRODES FOR USE IN FUSION SPLICING

Robert D. Munn, and George R. Stilwell, Jr., both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 15, 1985, Ser. No. 765,756
Int. Cl.⁴ G02B *6/38*
U.S. Cl. 350—96.21 **4 Claims**



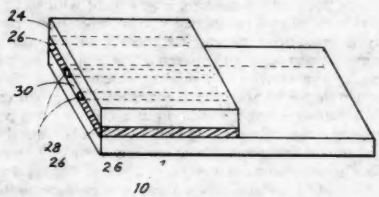
1. A fiber optic connector comprising:
(a) a ferrule having walls defining an interior splice chamber and first and second bores forming fiber-receiving paths extending from the splice chamber to first and second exterior points on the ferrule surface;
(b) a fiber stub secured within the first bore and extending from the first exterior point into the splice chamber; and
(c) splice electrodes permanently mounted in the ferrule walls and having inwardly extending tips defining an arc gap within the splice chamber, said electrodes being connectable to a voltage source for creating a plasma arc at the gap capable of fusing one end of the fiber stub to one end of a cable fiber guided into the splice chamber through the second bore.

4,598,975

MULTIPLE FIBER LINEAR ARRAY AND METHOD OF MAKING SAME

Anne B. Bussard, and Wanda S. Hutchison, both of Salem, Va., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 3, 1983, Ser. No. 538,239
Int. Cl.⁴ G02B *6/04*
U.S. Cl. 350—96.24 **16 Claims**



1. A multiple fiber linear array comprising first and second plate members each having a planar surface, said plate members being arranged in side-by-side relationship wherein their planar surfaces are adjacent each other, parallel spacers are fixed to each of said planar surfaces such that said planar surfaces are spaced apart a predetermined distance and form a passageway bounded on opposite sides by said spacers and open on the sides adjacent said spacers, a plurality of optical fibers extend into said passageway and terminate at one open side thereof, a portion of said optical fibers extend beyond the other open side thereof, said extending portion of said optical fibers includes a jacketed and an unjacketed section and the portion in said passageway is unjacketed, said fibers are generally parallel to and contiguous with each other over a substantial length from said one open side of said passageway and

extending toward said other open side thereof, the following approximations are generally followed in establishing the dimensions of the array:

$0.45 < D/W < 0.70$;

$0.70 < L/W < 1.00$; and

$0.50 < D/L < 0.90$

where D is the distance between said spacers, L is the distance between said other open end of said passageway and said jacketed optical fibers, and W is the width of said jacketed fibers when placed side by side.

4,598,976

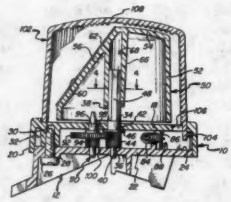
SIMULATED ROTATING LIGHT FOR CHILDREN'S VEHICLES AND THE LIKE

John P. McNett, Farmington, Conn., assignor to Coleco Industries, Inc., West Hartford, Conn.

Filed Apr. 29, 1985, Ser. No. 728,033

Int. Cl.[4] G02B 7/24

U.S. Cl. 350—79 **14 Claims**



1. A simulated rotating light device, such as for attachment to a toy vehicle, including:

a base member;

a rotor mounted upon said base member, said rotor having a body member with at least one light-reflecting surface thereon, and a pinion element for operative engagement with a driven gear member;

an actuating member having a gear segment thereon mounted upon said base member for pivoting about an axis offset from the axis of rotation of said rotor; and

a compound escapement clutch gear member having a first gear element in constant meshing engagement with said gear segment of said actuating member, and a second gear element disposed for meshing engagement with said pinion element of said rotor, said gear member being rotatably mounted upon said base member for shifting in an arc about said gear segment between a first position, in meshing engagement with said pinion element, and a second position displaced and disengaged therefrom, pivoting of said actuating member in one direction, from a rest position, simultaneously rotating said gear member and shifting it to said first position to effect engagement with said pinion element and rotation of said rotor, and return of said actuating member toward said rest position shifting said gear member to said second position thereof, disengaging said pinion element and thereby permitting free rotation of said rotor.

4,598,977

BI-LEVEL PHASE GRATING FOCUSING PLATE

Hiroshi Kobayashi, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

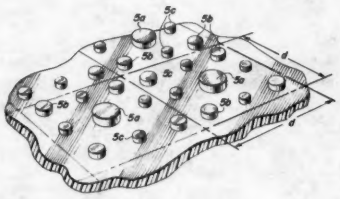
Filed Aug. 25, 1981, Ser. No. 296,136

Claims priority, application Japan, Aug. 26, 1980, 55-117925

Int. Cl.[4] G02B 5/18, 27/10

U.S. Cl. 350—162.2 **19 Claims**

1. A bi-level phase grating focusing plate for use in a camera viewfinder, comprising a substrate having a first surface and a number of unit patterns which are repeatedly and adjacently arranged on said first surface of said substrate so as to be sectioned from each other by imaginary boundaries therebetween in such a manner as to be defined by a minimum repetition pitch of the repeated arrangement thereof, respectively, wherein each of said unit patterns includes a plurality of means for creating a level difference for diffraction of light, each of which has a second surface which is parallel with and different in level from said first surface of said substrate such that each of said unit patterns causes diffraction of light due to the level difference between said first and second surfaces, the minimum



repetition pitch defining the smallest division of the focusing plate that can repeat the plurality of means for creating a level difference in a pattern of repetitive juxtaposition to each other on the focusing plate, and wherein said plurality of means of each said unit pattern is arranged within the minimum repetition pitch in an identical manner with those in the other unit patters and spaced nonconcentrically from each other, with the centers of said plurality of means being at different positions, respectively, to provide a symmetrical configuration.

4,598,978

SCREEN OF A DISPLAY DEVICE USING A MIXED THERMAL AND ELECTRICAL EFFECT

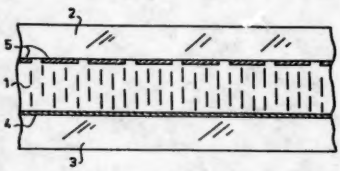
Bruno Mourey; Michel Hareng, and Lydie Thirant, all of Paris, France, assignors to Thomson CSF, Paris, France

Filed Feb. 22, 1983, Ser. No. 468,712

Claims priority, application France, Mar. 9, 1982, 8203937

Int. Cl.[4] G02F 1/13

U.S. Cl. 350—351 **5 Claims**



1. A screen for a thermoelectrically controlled display device comprising a first and a second plate, with at least one of said first and second plates being transparent, said plates enclosing an electro-optical material layer for reacting to a mixed thermal and electrical effect, said first plate supporting on its inner face at least one electrode and said second plate supporting on its inner face at least one heating electrode, said electrodes enabling the application of an electrical control field to said electro-optical material, said first plate having on the side facing said electro-optical material at least one layer of a thermal insulating material having a thermal conductivity below $2.5.10^{-3}$ Cal/cm.s.°C. and having a thickness at least equal to three times the thickness of said layer of electro-optical material, said first plate having a lower thermal conductivity than said second plate enabling said first plate to limit heat loss from said electro-optical material and said second plate to proportionately remove a predetermined amount of heat.

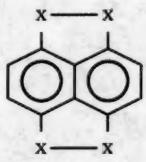
4,598,979

ELECTROCHROMIC DISPLAY DEVICE

Masami Sugiuchi, Yokohama; Masataka Miyamura, Kamakura; Atsuo Imai, and Shigeru Matake, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

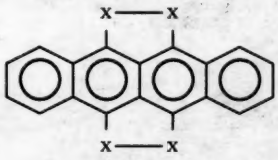
Filed Nov. 30, 1983, Ser. No. 556,596
Claims priority, application Japan, Nov. 30, 1982, 57-208478
Int. Cl.[4] G02F *1/01;* G01N *33/00;* G03G *5/026*
U.S. Cl. 350—357 21 Claims

1. An electrochromic display device comprising:
a transparent first electrode;
a second electrode opposing said first electrode which is spaced apart therefrom;
an electrochromic layer in a space formed between said first and second electrodes so as to be in contact with said first electrode, said electrochromic layer comprising an electrochromic material selected from the group consisting of a naphthalene derivative given by formula:



(I)

where X is sulfur, selenium or tellurium; a tetracene derivative given by formula:



(II)

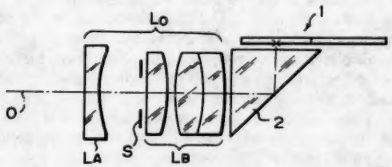
where X has the same meaning as above; and
an ionic conductor layer formed in said space so as to be in contact with said electrochromic layer.

4,598,980

OBJECTIVE OPTICAL SYSTEM FOR ENDOSCOPE

Yoshikazu Doi; Hitoshi Miyano; Toshiro Kishikawa, and Yasumasa Sunaga, all of Ohmiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1984, Ser. No. 631,867
Claims priority, application Japan, Jul. 23, 1983, 58-134872
Int. Cl.[4] G02B *13/04, 23/24*
U.S. Cl. 350—445 5 Claims



1. An objective optical system for an endoscope, which comprises a retrofocus objective lens assembly consisting of, a front-stage diverging lens unit, an aperture diaphragm, a rear-stage converging lens unit, and a prism positioned in this sequence along the path of the light beam from the object to the image formation surface of said objective lens assembly, and a self-scanning solid state image pickup device positioned at the image formation surface of said objective lens assembly and approximately in parallel with the longitudinal direction of the objective optical system, said objective lens assembly satisfying the conditions

$$0.8|f1|/f \leqq 1.5 \quad (1)$$

$$1 < f2/f \leqq 1.5 \quad (2)$$

$$Np > 1.7 \quad (3)$$

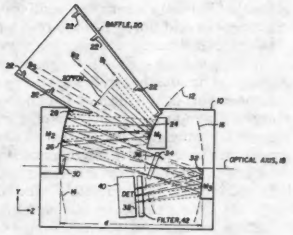
where f denotes the resultant focal length of the whole assembly, f1 denotes the resultant focal length of the front-stage diverging lens unit, f2 designates the resultant focal length of the rear-stage converging lens unit, and Np designates the refractive index of the prism.

4,598,981

WIDE-ANGLE FLAT FIELD TELESCOPE

Kenneth L. Hallam, Washington, D.C.; Barton J. Howell, College Park, and Mark E. Wilson, Greenbelt, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 5, 1985, Ser. No. 698,641
Int. Cl.[4] G02B *17/06;* G03B *11/04*
U.S. Cl. 350—505 17 Claims



1. An all-reflective wide-angle unvignetted flat-field telescopic imaging system, comprising:
baffle means for defining a predetermined relatively wide-angled field of view;
primary mirror means comprising a segment of a first spherical mirror and having a convex spherical reflecting surface positioned relative to said baffle means to receive and reflect input light beams received from a remote source;
secondary mirror means comprising a segment of an ellipsoidal mirror having a concave ellipsoidal reflecting surface positioned relative to said primary mirror means to receive and reflect light beams from said convex spherical reflecting surface of said first spherical mirror;
tertiary mirror means comprising a segment of a second spherical mirror and being positioned relative to said secondary mirror means to receive light from said concave ellipsoidal reflecting surface thereof and reflect said light beams to a planar focal surface;
aperture stop means located intermediate said secondary and tertiary mirror means;
said segments of said primary, secondary and tertiary mirror means being positioned offset from a common optical axis in a first direction and in alignment therewith in a second direction, and wherein the centers of said first and second spherical mirrors, the foci of said ellipsoidal mirror and the center of said aperture stop means are substantially coincident with said optical axis, whereby said light beams

pass through the system unobscured by any of said mirror segments; and

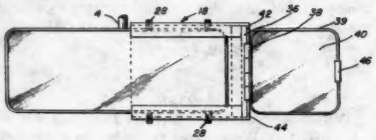
light detector means being positioned in front of the concave spherical reflecting surface of said tertiary mirror means at the location of said planar focal surface and clear of light being received by said tertiary mirror means from said secondary mirror means.

4,598,982

APPARATUS FOR EXTENDING REAR VIEW MIRROR

Leonard Levine, 2978 Beechwood Blvd., Pittsburgh, Pa. 15217

Filed Nov. 2, 1984, Ser. No. 667,828
Int. Cl.[4] G02B 5/08, 7/18
U.S. Cl. 350—626 9 Claims



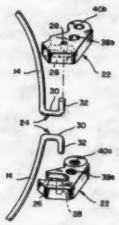
1. Apparatus for extending the viewing area of a rear view mirror supported in the interior of a motor vehicle, said rear view mirror comprising a substantially rectangular body, said apparatus comprising a substantially rectangular bracket housing, said housing including an elongated open front channel extending the length thereof, said channel being of a rectangular configuration for receiving a portion of said rear view mirror, adjustable fastening means extending into the channel for abutting edges of said portion of the rear view mirror for securing said bracket housing to the rear view mirror, said housing comprising at least a second elongated channel extending therethrough substantially parallel to said open front channel, a bracket member slidably disposed in said second channel for movement relative to said rear view mirror, an extension mirror, means for fastening said extension mirror to said bracket member for movement therewith, and stop means at an end of said second channel remote from said rear view mirror for abutting said bracket to preclude withdrawal of said bracket from said second channel while permitting said extension mirror to be extracted selectively from said end of said second channel.

4,598,983

METAL FRAME FOR EYEGLASSES

Vittorio Tabacchi, Piazza Tiziano n. 45, Pieve di Cadore, and Vincenzo Viel, Via Brustolon n. 12, Calalzo di Cadore, both of Italy

Filed Jun. 13, 1983, Ser. No. 503,425
Int. Cl.[4] G02C 1/08
U.S. Cl. 351—95 1 Claim



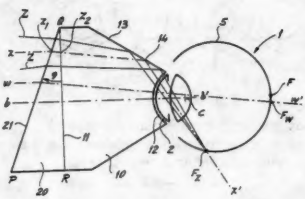
1. In a metal frame for eyeglasses of the type having metal wires rings in which lenses may be mounted, means mounted between the wire rings for positioning the frame on the bridge of the wearer's nose and a temple of the hinging bar type connected to each ring, an improved means for connecting the temple to the wire ring which comprises a pair of complementary U-shaped mirror image projections which are formed in the discontinuous wire ring, each U-shaped mirror image projection including a transverse member having connected to it a free end, a nose consisting of a pair of mirror image superposed plates, a set screw for clamping one superposed plate against the other, the engaged surfaces of the plates each having formed therein an anchor seat, each anchor seat comprising a groove in the surface of the plate in which the transverse member of the projection is received and a hole through the plate in which the free end of the projection is mounted, the grooved surface of the plates being mounted face to face to form the noses, each U-shape projection in the wire ring being form locked in the anchor seat, and a means for pivotally connecting a temple to the nose comprising a lug mounted on an end of the temple piece, and a cavity defined between the superposed plates of the nose into which the lug on the temple piece is movably mounted, the temple piece being movable between open and closed positions.

4,598,984

CONTACT LENS ARRANGEMENT FOR OPTICALLY EXAMINING AN EYE AND TREATING IT BY LIGHT IRRADIATION

Pascal Rol, Gunten, Switzerland, assignor to Lasag AG, Thun, Switzerland

Filed Dec. 28, 1984, Ser. No. 687,214
Claims priority, application France, Jan. 30, 1984, 84 01528
Int. Cl.[4] A61B 3/00; G02C 7/04
U.S. Cl. 351—219 9 Claims



1. A contact lens arrangement for optically examining an eye and treating it with an incident light beam, the beam traveling a distance e inside the lens arrangement between an entry surface and an exit surface which is applied to the eye, and the eye producing for said beam an astigmatism defined by a sagittal focal distance S and a tangential focal distance T, the lens arrangement comprising:

a principal element for focusing said beam onto a working point on the retina inside the eye, said principal element having a refractive index n and being provided with a plane entry surface and an exit surface forming said lens arrangement exit surface, the axis of said beam being displaced from the optical axis of said principal element and perpendicular to said plane entry surface thereof; and

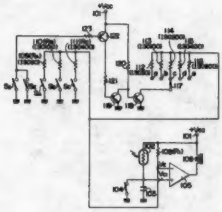
a compensating element having a refractive index n and a plane exit surface which is coupled with the plane entry surface of the principal element, said compensating element being provided with an entry surface forming said lens arrangement entry surface such that a plane tangent to said entry surface of the compensating element, at the point where the axis of said beam strikes the lens arrangement, is inclined with respect to the plane entry surface of the principal element by an angle which is selected on the basis of e, S, T and n so as to produce for said beam an astigmatism opposite to that of the eye.

4,598,985

EXPOSURE CONTROL DEVICE FOR CAMERA

Akira Inoue, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1984, Ser. No. 672,991
Claims priority, application Japan, Apr. 2, 1984, 59-66059
Int. Cl.[4] G03B 7/00
U.S. Cl. 354—21 19 Claims



1. An exposure control device for a camera comprising:

at least three read contacts for reading film speed information indicated on a film cartridge in the form of a binary code comprising at least three digits;

an adjustable reference voltage setting circuit including at least three automatic presetting resistors having their one end connected to a separate one of the at least three read contacts for developing at their other ends, which are connected in common, a reference voltage in accordance with the film speed information which causes the read contacts to be selectively turned on and off for use in the decision of an exposure level;

a photometric circuit for generating an output signal which is a function of the photoelectric conversion coefficient γ_c of the photometric circuit;

a comparator having a first input to which said other end of the at least three resistors is connected in common and a second input to which the output of the photometric circuit is directly connected; and

an exposure controlling member operative in response to an output signal from the comparator, the value of the photoelectric conversion coefficient γ_c being chosen so that the reference voltage applied to the first input of the comparator for more than four different values of film speed which are spaced apart at least by 1 EV are kept with in a permissible range of exposure errors so that the magnitude of the exposure errors is minimized;

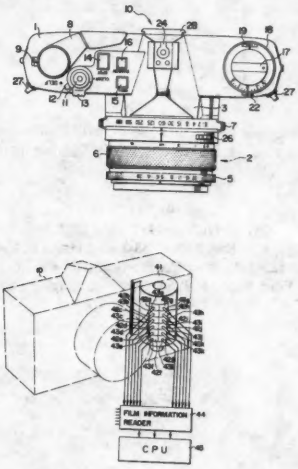
at least three of the read contacts which are used to read the three most significant digits of the binary code being allocated to read typical film speeds, each of such contacts and an associated resistor being connected in series between the first input of the comparator and the ground, whereby when a plurality of read contacts are turned on, a composite resistance formed by a parallel combination of the resistors which are connected to those contacts which are turned on define a reference voltage applied to the first input in accordance with the particular value of film speed designated by the film cartridge.

4,598,986

APPARATUS FOR EXPOSURE CORRECTION

Kazutoshi Shiratori, Hachioji; Takashi Kodama, Hino; Mitsuo Kawazoe, Hachioji; Tetsuo Miyasaka, Hachioji, and Masaki Nagao, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 590,380, Mar. 16, 1984. This application Sep. 4, 1985, Ser. No. 772,360
Claims priority, application Japan, Apr. 18, 1983, 58-68180
Int. Cl.[4] G03B 7/00
U.S. Cl. 354—21 10 Claims



1. An apparatus for exposure correction for use in a camera of automatic exposure control type, comprising:

correction means selectively enabled by an operation of a manual operating member for shifting an amount of exposure which is determined on the basis of an output from photometric means by a correction value toward overexposure or underexposure; and

means for varying the correction value entered by the correction means by operation of the manual operating member as a function of a characteristic of the film, whereby an exposure correction value alters the exposure in accordance with the characteristic of the film, when such a correction is desired.

4,598,987

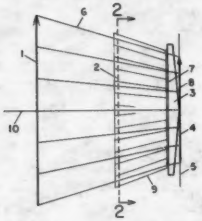
CONIC CAMERA

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Nov. 26, 1984, Ser. No. 674,805
Int. Cl.[4] G03B 17/00
U.S. Cl. 354—202 1 Claim

1. A conic camera comprising a conical lens (3) having a front plano face (7) and a rear convex conical face (8) which

receive and refract convergent conical rays (6) of an object (1), forming a convergent conical beam which is projected onto a



film (4) mounted parallel to and less than 0.5 mm from the apex of the convex conical face (8) of the conical lens (3).

4,598,988

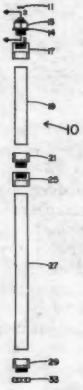
FILM DEVELOPING TUBE

Dean R. Hodge, Star Rte. 3 Box 133-1, and Daryl L. Culler, Star Rte. 3 Box 133-2, both of Cedarcreek, Mo. 65627

Filed Sep. 24, 1984, Ser. No. 653,602

Int. Cl.[4] G03D *13/04*

U.S. Cl. 354—312 **7 Claims**



1. A film developing tube apparatus for developing roll film comprising:

a non-flexible, opaque primary tube having an inside transverse dimension equal to or slightly less than the width of the roll film to be developed and having a longitudinal dimension equal to or slightly more than the unrolled length of the film to be developed for containing roll film in a longitudinally extended disposition during development;

a non-flexible, opaque extension tube have an inside transverse dimension matching the inside transverse dimension of the primary tube for adding to the length of the film developing tube when necessary, for longer than standard roll film lengths;

connection means for cooperatively joining the primary tube and extension tube;

cap means removably attached to the lower end of the primary tube;

light trap means capable of being removably attached to either the upper end of the primary tube or the upper end of the extension tube; and

cap means removably attached to the upper end of the light trap means.

4,598,989

CAMERA

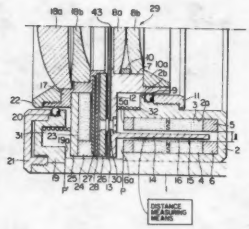
Minoru Yamada; Eiji Ito, and Masaru Nagai, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co. Ltd., Tokyo, Japan

Filed Dec. 22, 1983, Ser. No. 564,297

Claims priority, application Japan, Dec. 23, 1982, 57-225056; Dec. 23, 1982, 57-225057; Dec. 23, 1982, 57-225058; Dec. 23, 1982, 57-194059[U]; Dec. 23, 1982, 57-194060[U]

Int. Cl.[4] G03B *3/10*

U.S. Cl. 354—400 **8 Claims**



1. An automatic focusing camera comprising: a distance measuring means, a photographic lens-driving device having a cylindrical permanent magnet means which is provided fixedly inside of a lens barrel and a cylindrical moving coil member which is concentric with said cylindrical permanent means, a lens unit which is driven together with said cylindrical moving coil member, and a spring means for urging said lens unit to the most frequently employed focusing point of its traveling range, wherein said lens unit is adapted to move to a point corresponding to an output signal from said distance measuring means under the influence of said cylindrical moving coil member.

4,598,990

TONER IMAGE FIXING DEVICE

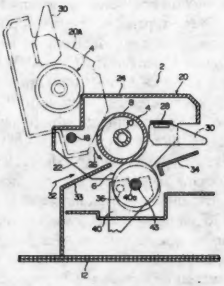
Hiroshi Kusumoto, Takaishi, and Yoshiyuki Uehara, Osaka, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Mar. 14, 1984, Ser. No. 589,933

Claims priority, application Japan, Mar. 28, 1983, 58-50371

Int. Cl.[4] G03G *15/20*

U.S. Cl. 355—3 FU **6 Claims**



1. A toner image fixing device comprising:

a rotatably mounted driven fixing roller drivingly connected to a driving source;

a rotatably mounted follower fixing roller;

a movable supporting member having mounted thereon at least one end of said follower fixing roller, said movable supporting member being mounted for free movement between a contacting position at which said follower fixing roller is kept in press contact with said driven fixing roller and a non-contacting position at which at least a greater portion of the longitudinal length of said follower fixing roller is maintained out of press contact with said driven fixing roller;

a press-contacting control mechanism for selectively holding said movable supporting member at said contacting position and at said non-contacting position;

said control mechanism including a positioning member connected to said movable supporting member through a spring means and mounted for free movement between an operating position, whereat said movable supporting member is moved to said contacting position and said follower fixing roller is brought into press contact with said driven fixing roller by the elastic biasing action of said spring means, and a non-operating position, whereat said movable supporting member is moved to said non-contacting position through the spring means;

actuating means for selectively holding said positioning member at said operating position and said non-operating position, said including a rotating input element drivingly connected to said driving source, a rotatably mounted cam element, spring clutch means interposed between said rotating input element and said cam element, and clutch control means adapted to be selectively held at a first restraining position and a second restraining position, such that when said clutch control means is moved from said first restraining position to said second restraining position, the rotation of said rotating input element is transmited to said cam element through said spring clutch means to rotate said cam element from a first angular position to a second angular position and said cam element acts on said positioning member to move it to said operating position, and when said clutch control means is moved from said second restraining position to said first restraining position, said cam element is rotated from said second angular position to said first angular position and said positioning member is moved to said non-operating position; and

an electromagnetic solenoid energizable to move said clutch control means to said second restraining position and deenergizable to move said clutch control means to said first restraining position, said electromagnetic solenoid being deenergized to thereby maintain said movable supporting member in said non-operating position at least while said driving source is deenergized.

4,598,991

DEVELOPING DEVICE

Masahiro Hosoya, Yokohama; Tsutomu Uehara, Yokosuka, and Takefumi Nosaki, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 29, 1984, Ser. No. 594,528

Claims priority, application Japan, Mar. 31, 1983, 58-56054

Int. Cl.⁴ G03G *15/08*

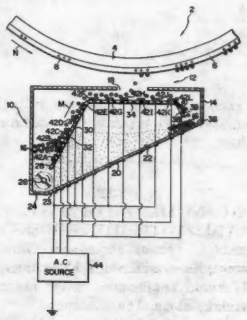
U.S. Cl. 355—3 DD **13 Claims**

1. A developing device for developing a latent image formed on an image support by supplying developer to the image support comprising:

container means for containing the developer therein and defining an opening through which the developer is released to the image support, said container means including a sloping bottom member;

a stationary developer carrier arranged inside the container at a location above the sloping bottom member, one end of said developer carrier being located near a lower side of said sloping bottom member of said container means and being immersed in the developer which accumulates at said lower side, said developer carrier having its other end located near a higher side of said sloping bottom member, said developer carrier extending between said one and other ends so as to dispose a portion of said developer carrier near said opening of said container means, said developer carrier also having a plurality of linear electrodes arranged thereon; and

electric field generator means for applying voltages to said linear electrodes on the developer carrier successively, starting from said one end to said other end of the developer carrier, to responsively generate an electric field on the developer carrier which electric field advances from said one end to said other end of the developer carrier according to a predetermined time lapse, wherein



said electride field generator means and said plurality of linear electrodes together comprise the means for carrying the developer along the developer carrier in a direction starting from said one end of said developer carrier towards said other end thereof by virtue of said advancing electric field so that a portion of the developer upon being carried to said developer carrier portion, is transferrable through said opening to be deposited upon the image support thereby to develop the latent image thereon and so that a residual portion of the developer which does not contribute to the developing of the latent image is further carried from said opening to said other end of the developer carrier to be deposited at said higher side of said sloping bottom member, wherein the developer then slides down by its own weight upon said sloping bottom member of said container means to accumulate at said lower side near said one end of said developer carrier.

4,598,992

ELECTROPHOTOGRAPHIC COPIER HAVING READILY REMOVABLE DRUM AND IMPROVED DRIVE SYSTEM THEREFOR

Benzion Landa, Alberta, Canada; Josef Rosen, Rehovot, and Avner Schneider, Ness Ziona, both of Israel, assignors to Savin Corporation, Stamford, Conn.

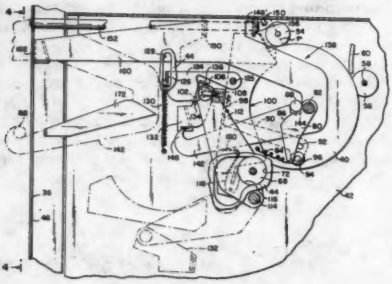
Filed Jul. 6, 1984, Ser. No. 628,389

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 DR **15 Claims**

1. In a copying machine, apparatus including in combination, a cabinet formed with an access opening, a drum adapted to occupy an operative position on said frame within said cabinet, said operative position being relatively remote from said access opening, first manually operable means for releasably locking said drum in its operative position, said first manually operable means comprising a member mounted on said frame for movement between a release position out of engagement with said drum and a locking position in engagement with said drum, a cradle adapted to receive said drum upon movement of said

member to its release position, and means mounting said cradle on said frame for movement of said drum along a path between a first position at which said drum is adjacent to said operative



position and a second position at which said drum is accessible at said opening, said locking position of said member being in said drum path.

4,598,993

PROCESS UNIT AND IMAGE FORMATION APPARATUS PROVIDED WITH THE PROCESS UNIT

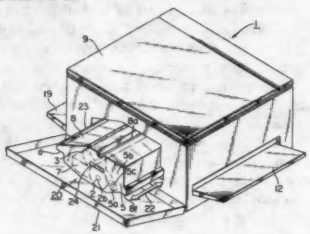
Morikazu Mizutani, Tokyo; Shigeyoshi Onoda, Yokohama; Akihiro Nomura, Kawasaki; Shinji Kanemitsu, Ichikawa, and Mototada Toriumi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

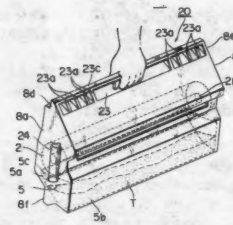
Continuation of Ser. No. 449,501, Dec. 13, 1982, abandoned. This application Apr. 23, 1985, Ser. No. 726,186

Claims priority, application Japan, Dec. 22, 1981, 56-208488

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 R **10 Claims**





1. A process unit having means for forming an image and removably mountable on an image forming apparatus body, the process unit comprising:

an image bearing member;

developer storing means for storing developer;

supporting means for supporting said image bearing member and said developer storing means on said body with respective longitudinal axes thereof extending horizontally; a

handle means extending in the direction of said longitudinal axes provided at said supporting means and constructed and arranged relative to said process unit so that when said process unit is dismounted from said image formation apparatus body and transported by said handle means, said longitudinal axes are maintained substantially horizontal.

4,598,994

IMAGE FORMATION APPARATUS CAPABLE OF DIFFERENT IMAGE MAGNIFICATION

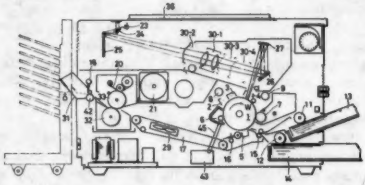
Masahiro Tomosada, Kawasaki; Katsuyoshi Maeshima; Tsuneki Inuzuka, both of Tokyo, and Hisashi Sakamaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

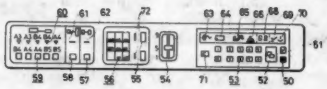
Filed Oct. 14, 1982, Ser. No. 434,222

Claims priority, application Japan, Oct. 22, 1981, 56-69262

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—14 R **11 Claims**





1. An image formation apparatus comprising:

input means for entering a desired magnification factor and a desired number of sheets of copy;

display means for displaying said magnification factor; and

control means for controlling said display means so that said display means displays said magnification factor according to said input means, said control means including discriminating means for discriminating whether or not the magnification factor entered from said input means is within a predetermined range.

4,598,995

COMBINED STRIPPING AND CONTACT FRAME WORK STATION

James W. Rogers, 8231 Wyngate St., #24, Sunland, Calif. 91040

Filed May 2, 1985, Ser. No. 729,546

Int. Cl.[4] G03B *27/20*

U.S. Cl. 355—91 **20 Claims**

1. A combined stripping and contact frame work station assembly comprising:

a work table;

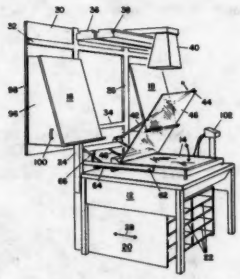
an easel;

means for mounting said easel for convenient access and viewing by a person working at said work table;

a vacuum contact frame having a working side provided

with a pivotal transparent plate and an easel side having a lip for retaining papers, and

means for mounting said vacuum frame for movement be-



tween a first working location with the vacuum frame flat on said work table and the transparent plate up, and a second location where the vacuum frame is clear of the table and the back thereof forms part of said easel.

4,598,996

TEMPERATURE DETECTOR

Tetsuo Taniuchi, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

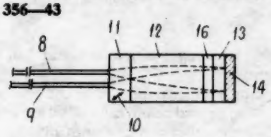
PCT No. PCT/JP82/00155, § 371 Date Dec. 14, 1982, § 102(e) Date Dec. 14, 1982, PCT Pub. No. WO82/03914, PCT Pub. Date Nov. 11, 1982

PCT Filed May 6, 1982, Ser. No. 453,881

Claims priority, application Japan, May 7, 1981, 56-69085; Nov. 17, 1981, 56-184581

Int. Cl.⁴ G01J *5/58*; G01K *11/12*

U.S. Cl. 356—43 **3 Claims**



1. A temperature detector comprises a light-signal generation part which generates light-signal, a sensor part located at a temperature measuring part, and optical fiber for signal transmission for imputting signal-light to said sensor part, received-light-signal processing part which receives light-signal output from said sensor part, wherein said sensor part comprises:

a temperature detection element consisting of $LiTaO_3$ single crystal or $Sr_xBa_{1-x}Nb_2O_6$ single crystal ($0.5<x<1.0$), a polarizer of one member selected from a group consisting of a rutile and a calcite, for polarizing input light to said temperature detection elements,

a rod lens disposed between said polarizer and said temperature detection element, and a quartz disposed between said rod lens and said temperature detection element for setting temperature range.

4,598,997

APPARATUS AND METHOD FOR DETECTING DEFECTS AND DUST ON A PATTERNED SURFACE

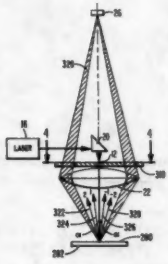
Edgar F. Steigmeier, Hedingen, and Heinrich Auderset, Horgen, both of Switzerland, assignors to RCA Corporation, Princeton, N.J.

Filed Jul. 19, 1982, Ser. No. 399,290

Claims priority, application United Kingdom, Feb. 15, 1982, 8204340

Int. Cl.⁴ G01N *21/89*

U.S. Cl. 356—237 **8 Claims**



1. In an apparatus of the type for optically detecting microscopic defects in a certain specularly reflecting surface of a given object, said surface having at least on a portion thereof a diffraction grating pattern or at least some elements of a diffraction grating pattern capable of diffracting said beam of light into diffracted beams of various orders, said apparatus comprising first means for scanning said reflecting surface with an incident beam of light that illuminates a relatively small spot area of said entire reflecting surface area, which spot area is large relative to the area of any microscopic defect, the incident beam of light being directed to said surface such that a substantial amount of light scattered from the surface illuminated by the incident beam of light is detected substantially independently of light specularly reflected from the same surface, and a second means for varying the threshold of detection of the scattered light, the improvement characterized by:

means comprising a disc member positioned in said apparatus between said surface and said detector and having a central aperture with a diameter sufficient to pass a substantial amount of said scattered light, the incident beam of light being directed to said surface at an angle such that diffracted beams of low diffraction orders do not pass through said central aperture.

4,598,998

SCREW SURFACE FLAW INSPECTION METHOD AND AN APPARATUS THEREFOR

Mitsuhito Kamei, Hyogo; Shin Nemoto, Osaka, and Souji Ishimoto, Yamatokohriyama, all of Japan, assignors to Sumitomo Kinzoku Kogyo Kabushiki Kaisha, Osaka and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of, Japan

Filed Feb. 24, 1983, Ser. No. 469,234

Claims priority, application Japan, Feb. 25, 1982, 57-29685; Feb. 25, 1982, 57-29686

Int. Cl.⁴ G01N *21/32*

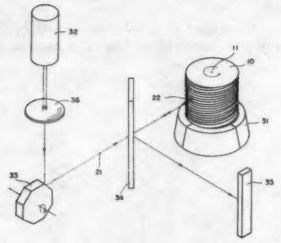
U.S. Cl. 356—237 **14 Claims**

1. A method of detecting flaws on a surface of a screw, comprising the steps of:

projecting a light beam onto the surface of the screw at an angle to an enveloping surface of the screw that is smaller than a complementary angle between a flank of a screw thread and said enveloping surface in a manner to be reflected therefrom;

moving the light beam along the surface of the screw to scan the surface of the screw;

detecting the intensity of light reflected from said screw as the light beam moves therealong; and



detecting a surface flaw of said screw based on a time base variation of the intensity of said reflected light.

4,598,999

AREA DETECTION METHOD OF AN ORIGINAL FOR USE IN COPYING MACHINES

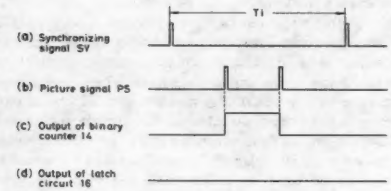
Masami Kurata, and Hiroyuki Saitoh, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1983, Ser. No. 551,878

Claims priority, application Japan, Nov. 19, 1982, 57-203447

Int. Cl.[4] G01B *11/28, 11/02;* G03B *27/44*

U.S. Cl. 356—380 **5 Claims**



1. An area detection method of an original for use in copying machines comprising steps of:

entering a mark of a specific color onto an original so that the mark encloses an area of the original;

scanning the original by a photosensor to cause the mark to be detected by the photosensor;

judging whether the number of mark segments detected by the photosensor in a single scan line is an even or odd number for each scan line; and

detecting the area enclosed by the mark based on the output of the photosensor in the scan lines for which the judgement is made that the number of the detected mark segment is an even number.

4,599,000

POSITION DETECTION SIGNAL PROCESSING APPARATUS

Yasuyoshi Yamada, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1983, Ser. No. 465,103

Claims priority, application Japan, Feb. 19, 1982, 57-25677

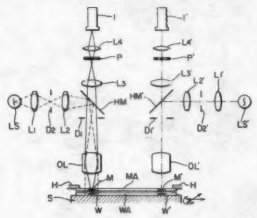
Int. Cl.[4] G01B *11/00*

U.S. Cl. 356—401 **24 Claims**

1. A position detection signal processing apparatus comprising:

pattern detecting means for detecting a pattern on a body and repeatedly producing a detection signal including at least one part representative of the pattern;

expectation signal forming means for forming an expectation signal which specifies the portion of said detection signal in which the probability is high if occurrence of part of the detection signal representative of the pattern, said expectation signal forming means including summing means for forming a summation of repeated production of the detection signal and for forming a summation signal therefrom,



and summation discriminating means for discriminating said summation signal in accordance with a desired threshold value; and

pattern signal forming means for forming a pattern outout signal corresponding to-the pattern from said detection signal and said expectation signal.

4,599,001

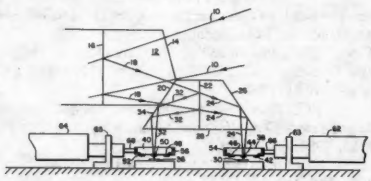
MULTISPECTRAL LINEAR ARRAY MULTIBAND SELECTION DEVICE

Herbert L. Richard, Crofton, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 2, 1984, Ser. No. 606,426

Int. Cl.[4] G01J *3/51*

U.S. Cl. 356—419 **8 Claims**



1. Apparatus for selecting multiple spectral bands of an optical beam comprising:

means for providing a selected number of one or more composite beams of an optical beam, each of which composite beams being composed of a plurality of diverse spectral bands;

a fixed elongate detector array individually positioned in the path of an impinging one of each of said composite beams;

a tray proximately overlaying each fixed detector array and carrying a plurality of elongate filters with diverse bandpass characteristics which are unique to each tray, each tray being moveable across the composite beam impinging upon its associated fixed detector array;

a pair of flexible members individual to each tray;

a stationary base connected to each pair of flexible members such that a flexible, parallelogram-type four bar linkage is formed; and

moving means individual to each tray for positioning a selected one of the plurality of elongate filters carried by the tray into the path of the composite beam impinging upon its associated fixed detector array, said selected one of said filters being axially aligned with said associated detector array.

4,599,002

SCREW EXTRUDER FOR REDUCING THE VOLUME OF MATERIALS

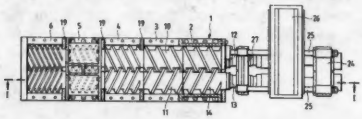
Max Gutknecht, Mühlenstrasse 141, Ellikon an der Thur, Switzerland

Filed Jan. 4, 1984, Ser. No. 573,932

Claims priority, application Switzerland, May 17, 1982, 3062/82

Int. Cl.[4] B29B 7/18, 7/20

U.S. Cl. 366—85 8 Claims



1. A screw extruder for compressing a material to be compressed, comprising:

plural contiguous screw extruder units arranged in a line each of said units having a casing member defining an inlet and an outlet, an elongated screw member disposed in each of said casing members and extending between the inlet and outlet of said casing members said screw members having a core defining a first circumferential dimension and a thread wrapped about the core defining a second circumferential dimension larger than the first circumferential dimension, the first and second circumferential dimensions defining a screw member free-section, and each of said units including a throttle plate member disposed in each of said casing members proximate the inlet of said casing members the direction of elongation of the screw members said throttle plate member and having an orifice therethrough having a preselected dimension selected to be greater than said first circumferential dimension but less than said second circumferential dimension so as to effectively block the free-section of the screw members;

whereby, material to be compressed sequentially introduced through each of said contiguous screw extruder units are pressed against said throttle plate member of a corresponding screw extruder unit with a large force thereby causing heat that creates pulverization and drying of the material by friction on each of said throttle plate members before passing through the corresponding orifices of said throttle plate members having said preselected dimension that effectively blocks the free-section of the corresponding screw members.

4,599,003

MULTIPURPOSE KITCHEN MACHINE WITH WORKING CONTAINER

Heinz Schiebelhuth, Frankfurt am Main; Wolfgang Franke, Langen; Hartwig Kahlcke, Kronberg, and Günter Oppermann, Dietzenbach, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Jan. 22, 1985, Ser. No. 693,563

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1984, 3404249

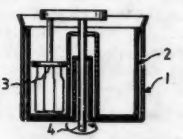
Int. Cl.[4] B01F 7/30

U.S. Cl. 366—241 4 Claims

1. A multipurpose food processing machine, having a motor and a tool, comprising:

a working container having a first circular bottom portion, including a first centrally disposed aperture, said working container including a first outer wall disposed about the circumference of said bottom portion, and a first inner wall, having a first open free end, disposed about the circumference of said first aperture and extending into said working container;

an inner container, removably insertable in said working container, having a second circular bottom portion, including a second centrally disposed aperture, said inner container including a second outer wall, having an upper edge, disposed about the circumference of said second bottom portion, and a second inner wall, having a second open free end, disposed about the circumference of said second aperture and extending into said inner container, said second outer wall including a projection means proximate the outside of said upper edge of said second outer wall for fixedly locking said inner container to said working container whereby rotation of said inner container with respect to said working container is prevented; and



a coupling means, including a shaft member having a first and second end, said first end of said coupling means being connected to the motor, and said second end of said coupling means being connected to the tool, the tool projecting into the interior of said inner container between said second inner wall and said second outer wall, said shaft member being connected between said first and said second ends of said coupling means and being disposed through said first and second open free ends of said first and second inner walls, respectively.

4,599,004

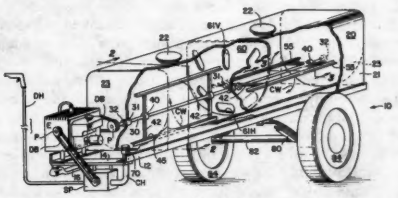
CONTINUOUS MIXING TANK FOR LIQUID SPRAY CHEMICALS

Daniel Keith, Star Rte. #A, Box 195, Hobbs, N. Mex. 88240

Filed Oct. 12, 1984, Ser. No. 660,272

Int. Cl.[4] B01F 7/04

U.S. Cl. 366—241 9 Claims



1. A transportation liquid chemical mixing device comprising an elongated container for holding liquid chemicals to be thoroughly mixed for a spraying operation;

baffle means dividing said elongated container into two parts;

first agitator means in one of said container parts;

second agitator means in the other of said container parts; and

means for commonly driving both said first and second agitator means in a manner to effectively continuously move said liquid chemicals through said baffle means for thoroughly and completely mixing said liquid chemicals, the baffle means comprising a full baffle panel completely dividing the cross-sectional area of the container, said baffle being provided with a plurality of aperture means for increasing agitation of liquid chemicals flowing therethrough, said aperture means comprising six slots, three of said slots being in the lower portion of said baffle panel and three being in the upper portion of said baffle, the lower three slots having a center slot arranged horizontally and the other two slots being at each end thereof and at a predetermined angle thereto, and the upper three slots having a center slot ar-

ranged vertically and the other two at either side thereof and at a predetermined angle thereto.

4,599,005

STEP MOTOR CONTROL MECHANISM FOR ELECTRONIC TIMEPIECE

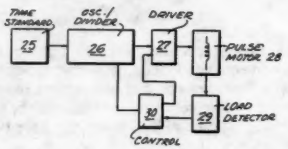
Yoshikazu Kawamura; Minoru Hosokawa; Sakiho Okazaki, and Hiroshi Ishii, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Division of Ser. No. 430,292, Sep. 30, 1982, Pat. No. 4,522,507, which is a continuation of Ser. No. 133,046, Mar. 24, 1980, Pat. No. 4,370,065, which is a continuation of Ser. No. 839,867, Oct. 6, 1977, Pat. No. 4,212,156. This application Jun. 10, 1985, Ser. No. 742,832

Claims priority, application Japan, Oct. 6, 1976, 59-120146

Int. Cl.[4] G04F *5/00*; G04C *3/00*

U.S. Cl. 368—157 **2 Claims**



1. An electronic timepiece having a step motor and comprising a quartz crystal vibrator producing a high frequency time standard signal, divider circuit means for producing low-frequency time signals in response to said high frequency time standard signal; a gear train driven by said step motor and adapted to place the step motor in one of a first normally loaded condition and a second loaded condition; load detection means for producing a load detection signal in response to detecting said second loaded condition of said step motor; driving and control means intermediate said divider circuit means and said step motor for receiving the low frequency signal from the dividing circuit means, said driving and control means being adapted to apply a first drive signal having a first pulse shape to said step motor in response to said low frequency signal, said driving and control means in response to said load detection signal being applied thereto, being adapted to apply to said step motor a second drive signal having a second pulse shape of larger energy than said first pulse shape, said step motor including a drive coil for receiving said first drive signal produced by said driving and control means, said load detecting means being adapted to detect the induced current in said coil after said first drive signal is applied thereto and said load detecting means including a control circuit having at least a first period for detecting said induced current after the application of said first drive signal and a second period during which said induced current is not detected, said second period following said first period.

4,599,006

CARTRIDGE BEARING ASSEMBLY

Martin L. Abel, Franklin, Mich., assignor to Permawick Bearing Corporation, Detroit, Mich.

Continuation of Ser. No. 495,410, May 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 257,098, Apr. 24, 1981, Pat. No. 4,392,753, which is a continuation of Ser. No. 081,614, Oct. 3, 1979, abandoned. This application Jun. 6, 1985, Ser. No. 742,123

Int. Cl.[4] F16C *23/04*

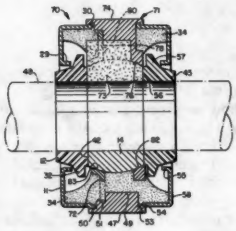
U.S. Cl. 384—136 **5 Claims**

1. A bearing assembly for supporting a rotatable shaft to be journalled in the bearing assembly comprising:

(1) a bearing member having a spherical outer surface at each end thereof and a central bore sized to receive the rotatable shaft in a bearing relationship, said bearing member being pervious to the passage of oil from its outer surface to its central bore;

(2) a rigid cast mounting member having an outer surface, an inner surface and a radially inwardly extending mounting flange, said flange having a spherical surface near its inner edge slidably engaging the spherical surface at one end of the bearing, said flange having openings therein to enable lubricant to pass through the flange;

(3) a non-unitary retainer mounted on said support means and having a spherical surface near the inner edge thereof slidably engaging the spherical surface at the other end of said bearing member to clamp the bearing member between the unitary flange and the non-unitary retainer in a press fit whereby a first cavity is defined by the outer



surface of said bearing member and inner surfaces of said mounting member, said flange and said retainer;

(4) an oil slinger positioned adjacent to each end of said bearing member to sling lubricant radially outward, said oil slingers being sized to be press fit on the rotatable shaft for rotation therewith;

(5) two cap means each defining second cavities that are disposed radially outwardly from each of said oil slingers and in communication with said first cavity through openings defined in said flange and said retainer; and

(6) a lubricant-impregnated wicking material located within said first and second cavities and said openings defined in said flange and said retainer, such that oil slung by said slingers is received within said second cavities and transferred to said first cavity through said openings.

4,599,007

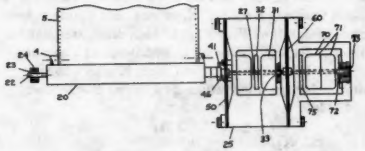
RECIPROCATING DRIVE MECHANISM

Hossein Khorsand, 25561 Via Inez, San Juan Capistrano, Calif. 92675

Filed Oct. 9, 1984, Ser. No. 658,672

Int. Cl.[4] B41J *25/28, 19/50*

U.S. Cl. 400—322 **10 Claims**



1. A reciprocating drive mechanism for printers comprising:

a frame;

a printer hammer bank;

a drive means for reciprocating said hammer bank relative to said frame;

a non-linear spring set comprising a plurality of spring strips, said spring strips being in single or parallel planes with one another and not deflected relative to one another, said spring set secured to said hammer bank and to said frame for recip-

rocation of said hammer bank by the nonlinear vibration of said spring set; and

a servo system for controlling said drive means and for positioning said hammer bank for proper print placement.

4,599,008

FINGERNAIL POLISH CAPSULE AND PLUNGER

Patrick J. Furlong, Carlsbad; Jack R. Evers, Coronado, and Brian R. Pike, Carlsbad, all of Calif., assignors to FIN-TECH Limited Partnership, Tucson, Ariz.

Filed Jun. 28, 1985, Ser. No. 750,077

Int. Cl.⁴ A46B *11/02*

U.S. Cl. 401—133 **16 Claims**

1. A combination brushable product dispenser and brush assembly comprising a tubular cartridge having an integral closed end and an open end, said closed end including an end panel having formed therein a weakening line defining a first removable panel portion, a plug having a forced fit in said cartridge open end and sealing said cartridge open end, said plug having an integral closed end and an open end, said plug closed end being within said cartridge and opposing said cartridge closed end, said plug closed end including an end panel having formed therein a weakening line defining a second removable panel portion, cooperating means on said cartridge and said plug limiting telescoping of said plug into said cartridge, a piston within said cartridge adjacent said cartridge closed end, said brush assembly including a head trapped within said plug for relative axial movement and a projecting brush portion, said head including an axial projection forming means for displacing said second removable panel portion from said plug closed end into said cartridge and to open said cartridge to said brush portion, and a plunger forming means for first displacing said first removable panel portion from said cartridge closed end into said cartridge and then advancing said piston towards said plug to dispense a liquid from within said cartridge into said head to said brush portion.

4,599,009

PAINT ROLLER SEALING SYSTEM

Walter E. Winston, Carmel, Ind., assignor to Black & Decker Inc., Newark, Del.

Filed Jun. 22, 1984, Ser. No. 623,321

Int. Cl.⁴ B05C *17/02*

U.S. Cl. 401—197 **31 Claims**

1. A paint roller assembly, comprising:

roller core means for rotation about a rotational axis, and having a central cavity extending along said axis;

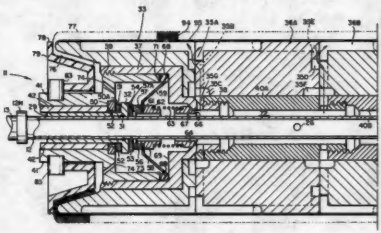
a paint supply tube extending into said cavity through an open end thereof and along said axis;

bearing means, located at said open end of said cavity, for rotatably mounting said core means on said supply tube;

a stationary seal secured to and encircling said supply tube;

rotating seal means, associated with said core means and encircling said axis, for rotation with said core means and for sealingly engaging said stationary seal;

said stationary seal and said rotating seal means being located in said cavity adjacent but axially inward of said bearing means for preventing paint in said cavity from escaping along the outside of said tube through said bearing means;



a diaphragm having an inner portion encircling but spaced radially outwardly from said supply tube, said inner portion being connected to said rotating seal means and rotatable therewith; and

said diaphragm extending radially outwardly from said rotating seal means with an outer periphery of said diaphragm being sealed to said core means, said diaphragm sealing said cavity adjacent said end between said rotating seal means and said core means radially outwardly of said rotating seal means.

4,599,010

ANCHORING DEVICE

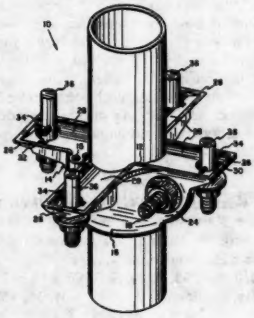
Warwick P. Hocking, Durban, South Africa, assignor to Tu-Fit (Proprietary) Limited, Durban, South Africa

Filed Jun. 4, 1984, Ser. No. 616,667

Claims priority, application South Africa, Jun. 10, 1983, 83/4271

Int. Cl.⁴ F16B *7/.8*

U.S. Cl. 403—191 **9 Claims**



1. An anchoring device including a body having a substantially cylindrical passage formed therein by at least two elements having fastening means for connecting the elements to each other and to a constructional element, the device including at least one member forming a support face at an angle to a surface of the body, the support face being adapted to be abutted by a side of the transverse element and the member

having a passage for receiving a bolt element in pivotal relationship and an inclined surface for seating a nut element.

4,599,011

ARTICLE-JOINING DEVICE

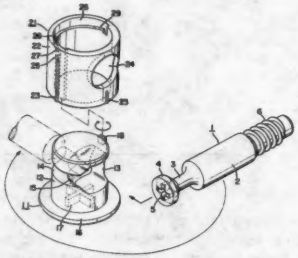
Hidenori Tashiro, Hirakata, and Minoru Watanabe, Kokubunji, both of Japan, assignors to Kabushiki Kaisha Murakoshi Seiko, Tokyo, Japan

Filed Nov. 1, 1985, Ser. No. 793,754

Claims priority, application Japan, Nov. 7, 1984, 59-168969[U]

Int. Cl.[4] B25G *3/00*; F16B *7/08*

U.S. Cl. 403—407.1 **2 Claims**



1. An article-joining device comprising:

a connecting rod having its stem formed at the leading end thereof with a fastening head by a reduced intermidate portion and at its base with a fixing portion to be attached to a first member; and

a fastening member adapted to be rotatably fitted in a second member and having its column-shaped body formed in the side thereof with both an insert hole, into which the fastening head of said connecting rod is to be inserted, and a slot for receiving the intermediate portion of said connecting rod laterally from one side of said insert hole, said fastening member being formed on the inner side of said slot with a cam face for fastening said fastening head,

wherein the improvement is characterized:

in that said fastening member has its body formed with an engagement projection on one side thereof; and

in that a cylindrical fastener case is provided to be fitted on the outer side of the body of said fastening member and is formed on its outer side with a plurality of fixing ridges to be retained in a mounting hole of said second member, in its side with an insert hole corresponding to the insert hole of said fastening member, in its inner side with a guide groove extending longitudinally thereof for guiding therein the engaging projection of said fastening member, and in an upper portion of its inner side with a step extending circumferentially thereof and merging into said guide groove for engaging and supporting said engaging projection.

4,599,012

SELF-REDRESSING SLALOM POLE

Wolfgang Kugler, Karrösten, and Wolfgang Ostermann, Reith bei Seefeld, both of Austria, assignors to IMS-Kunststoffgesellschaft m.b.H., Innsbruck, Austria

Filed Nov. 19, 1984, Ser. No. 672,807

Claims priority, application Austria, Nov. 18, 1983, 4061/83

Int. Cl.[4] E01F *9/01*

U.S. Cl. 404—10 **8 Claims**

1. A self-redressing, slalom pole comprising a standpipe, a ground part to be inserted into the ground and a tipping element arranged between the ground part and the standpipe, said standpipe comprising fiber-reinforced synthetic material and having a wall thickness that tapers off in steps from bottom to top, said fiber-reinforced synthetic material being applied in several layers including outer and inner layers, said fiber-reinforced synthetic material including, in at least said outer layer, a synthetic resin fiber construction embedded in a matrix of synthetic resin, said fiber-reinforced synthetic material including threads with an orientation substantially in a longitudinal direction of said standpipe and including, in at least a lower partial area of said standpipe, further threads oriented transverse to the pipe axis.

4,599,013

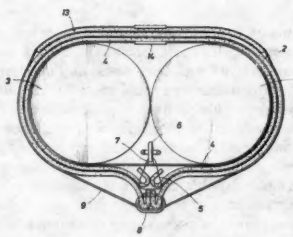
FIREPROOF BOOM

Wayne F. Simpson, Anchorage, Ak., assignor to Shell Western E&P Inc., Houston, Tex.

Filed Oct. 31, 1984, Ser. No. 666,717

Int. Cl.[4] E02B *15/04*

U.S. Cl. 405—72 **6 Claims**



1. A fireproof boom for containing a flammable pollutant on a water surface comprising, a hollow flotation member susceptible to expanding and bursting with the application of heat, and at least two layers of heat-resistant, water-sorbent material surrounding the flotation member and extending into the water and functionable to perform an osmotic wicking action to draw water up into the layers of the heat-resistant material and around the flotation member, thereby positioning the water to form protective steam about the flotation member upon exposure of the boom to fire.

4,599,014

BUOYANT GUYED TOWER

Terrence L. McGillivray, Santa Rosa, and Thomas B. Coull, Hayward, both of Calif., assignors to Bechtel International Corporation, San Francisco, Calif.

Filed Apr. 16, 1985, Ser. No. 723,784

Int. Cl.[4] E02B *17/00*

U.S. Cl. 405—225 **13 Claims**

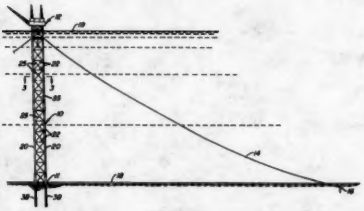
1. Apparatus for supporting an offshore drilling and production platform comprising:

a tower adapted to be mounted in an operative, generally upright position on the sea bottom and to extend upwardly

to a location above the mean water level of the sea, the upper end of the tower adapted to be coupled to the platform in supporting relationship thereof; and

a plurality of guy lines coupled to the tower near the upper end thereof and adapted to extend outwardly and downwardly therefrom in a number of different directions, the lower ends of the guy lines adapted to be anchored in the sea bottom;

said tower having a plurality of legs, each of the legs being tubular and having a buoyant chamber for exerting a buoyant resorting force on the tower when the tower is in said operative position;



there being a number of tubular piles extending into and through each leg, each pile being secured at its upper end to the corresponding leg near the upper end of the leg, each pile extending outwardly and downwardly from the lower end of the corresponding leg, whereby the lower ends of the piles can extend into the sea bottom when the tower is in said operative position;

each pile adapted to receive a well extending downwardly from the platform when the platform is mounted on and supported by the upper end of the tower, each well adapted to extend into the sea bottom for production of resources from a location below the sea bottom.

4,599,015

DEVICE FOR DOSING LOOSE MATERIAL

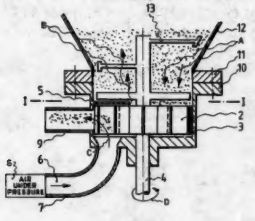
Wolfgang Krambrock, Aichenwiesen 18, D-7981 Vogt, Fed. Rep. of Germany, assignor to Wolfgang Krambrock, Vogt, Fed. Rep. of Germany

Filed Aug. 10, 1984, Ser. No. 639,953

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1983, 3329299

Int. Cl.[4] B65G *53/46*

U.S. Cl. 406—66 **10 Claims**



1. Apparatus for oosing loose material into at least one pneumatic conveyor conduit, comprising a cylindrical housing arranged with its central axis in a vertical direction, said housing having a feed opening for the supply of loose material at its upper end, a wall closing at its bottom end, and a discharge outlet extending radially through the perimetrical wall thereof, a bucket wheel located in said housing and rotatable about said vertical axis, said bucket wheel being formed by central hub and a plurality of radially extending blades defining a plurality of chambers, each adapted to be filled with loose material and rotatable into registry with the discharge outlet, an inlet duct extending through the wall closing at the bottom end of said housing below said discharge opening, said duct introducing air axially into said bucket wheel chamber in registry with said discharge outlet and perpendicularly to the flow of material through said discharge outlet and a horizontally disposed baffle plate located above said discharge outlet, said baffle plate having an area covering the top of said bucket wheel for a space of at least one chamber of said bucket wheel and enclosing the chamber in registry at said discharge opening to enhance the discharge of loose material therefrom in cooperation with said axially introduced clearing air.

4,599,016

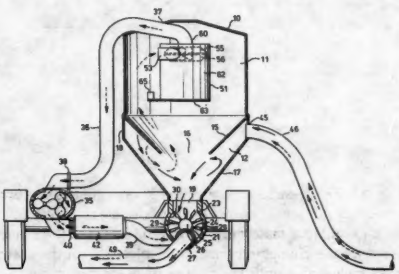
CYCLONE APPARATUS FOR PNEUMATICALLY MOVING GRANULAR MATTER

J. John Medemblik, Guelph, Canada, assignor to Walinga Body & Coach Limited, Guelph, Canada

Filed Jul. 12, 1985, Ser. No. 754,230

Int. Cl.[4] B65G *53/40, 53/60*

U.S. Cl. 406—67 **9 Claims**



1. A pneumatic conveyance apparatus for moving granular matter, comprising:

an enclosed container having a lower cyclone portion and an upper portion defined by an internal partition having an aperture therethrough allowing communication between the portions, said container having at least one inlet for sucking air and granular matter into the lower cyclone portion, and having an outlet for exhausting air from the upper portion;

valve and duct means for conveying granular matter collected in the lower cyclone portion therefrom;

a blower connected between the container outlet and the valve and duct means for creating a partial vacuum in the container and an elevated pressure at the valve and duct means; and

a secondary cleaner for air leaving the container and entering the blower, comprising an intake for particulate containing air within the upper portion of the container, the intake leading tangentially into a cyclone forming means, said means having opposed frustoconical members joined at their respective bases so as to define a slot or a plurality of ports about the circumference of the means at the area of the join, a container enclosing the cyclone means for collecting particles ejected from the cyclone, and an outlet for cleaned air leaving the cyclone means.

4,599,017

METHOD OF AND DEVICE FOR AUTOMATIC CHARGING A PLURALITY OF RECEIVING STATIONS WITH PULVERIZED MATERIAL

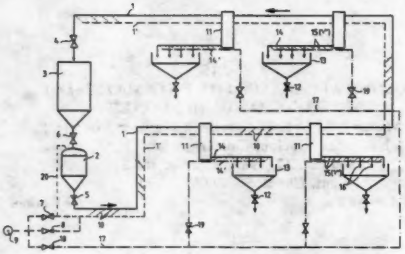
Hans Rüssemeyer, Walle; Karl-Heinz Pollak, and Gerhard Hoffmann, both of Braunschweig, all of Fed. Rep. of Germany, assignors to Bühler-Miag GmbH, Braunschweig, Fed. Rep. of Germany

Filed Mar. 8, 1984, Ser. No. 588,133

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310452

Int. Cl.[4] B65G *53/06*

U.S. Cl. 406—95 8 Claims



4. A device for automatic pneumatic charging of a plurality of receiving stations, comprising storage means for a pulverized or granulated material, a source of pressure fluid, a main conveying line connected via shutoff means with the material storage means and with the source of pressure fluid to pneumatically convey said material in a feeding direction, a plurality of intermediate containers assigned to respective receiving stations and each having an upper portion communicating at consecutive locations with said main conveying line, a pressure fluid supply line accompanying the main conveying line and being connected via shut-off means with the source of pressure fluid and via a plurality of one-way valves with said main conveying line, a branch conduit communicating with a lower portion of each intermediate container and being provided with at least one sink pipe having an outlet, each at least one sink pipe being located above a preliminary storage hopper at each receiving station, and auxiliary pneumatic line connected to said source of pressure fluid and being connected to each branch conduit via a plurality of throttling or undirectional valving means so as to fluidize the material in each branch conduit when the outlet of its at least one sink pipe is open and discharge the fluidized material through its at least one sink pipe substantially without pressure by gravity into the corresponding preliminary storage hopper located under its at least one sink pipe until the level of charge in the preliminary storage hopper reaches the outlet of that at least one sink pipe whereupon the residual pressure in the intermediate container plugs that branch conduit and stops the discharge and, after the charge in the preliminary storage hopper drops below the level of the outlet of that at least one sink pipe, the fluidizing process and the discharge of the material from that branch conduit is restarted.

4,599,018

AUTOMATIC TRAVERSING DRILLING UNIT AND METHOD OF USING

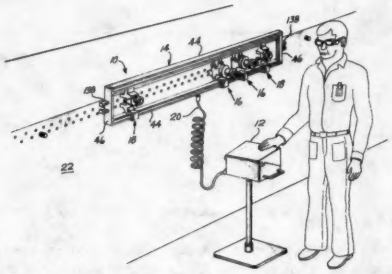
Quentin T. Woods, Redmond, Wash., assignor to The Boeing Company, Seattle, Wash.

PCT No. PCT/US84/00225, § 371 Date Feb. 13, 1984, § 102(e) Date Feb. 13, 1984, PCT Pub. No. WO85/03466, PCT Pub. Date Aug. 15, 1985

PCT Filed Feb. 13, 1984, Ser. No. 772,297

Int. Cl.[4] B23B *35/00, 39/14*

U.S. Cl. 408—1 R 16 Claims



2. A traversing unit for incrementally moving along and drilling an elongated surface comprising: a pair of spaced apart support members, a first latch member extending between and attached adjacent an end of the pair of support members, a second latch member extending between and attached adjacent an opposite end of the pair of support members, means for securing each of the latch members to an elongated wing surface to be drilled, a pair of drilling units with each unit mounted between and secured to the support members in a manner to permit reciprocal motion of the drilling units parallel to and normal to the support members to position the units for drilling, means mounted on each drilling unit for securing the drilling units to said elongated surface and means for advancing the support members over the elongated surface while said drill units are secured to said surface to permit drilling along the length of that surface.

4,599,019

OVERLOAD COUPLING DEVICE

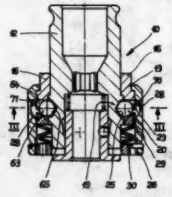
Paul Ueberall, Neuhausen, Fed. Rep. of Germany, assignor to Otto Bilz, Werkzeugfabrik, Ostfildern, Fed. Rep. of Germany

Filed Oct. 25, 1984, Ser. No. 664,885

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1983, 3345948

Int. Cl.[4] B23Q *5/22*

U.S. Cl. 408—139 15 Claims



1. In an overload coupling device for thread-cutter chucks or quick-change inserts therefor, comprising a cylindrical sleeve loadable with the rotational drive moment, a drive shank drivable by said drive sleeve and held coaxially and rotatably within said sleeve; a spring-loaded ball-pocket cou-

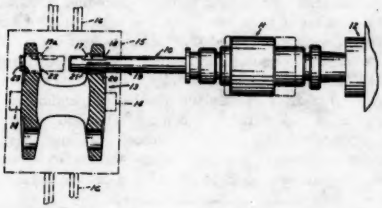
pling with adjustable tripping torque positioned in a force transmission flux between said drive sleeve and said drive shank and including a plurality of coupling balls which couple said drive shank with said drive sleeve, said drive sleeve being formed with a plurality of cage slots which are inwardly and outwardly open in a radial direction and which are open in an axial direction on axial end faces thereof, said cage slots each receiving one of said coupling balls, the angular width of said cage slots being at least as great as the diameter of each coupling ball, said drive shank having a peripheral surface facing said drive sleeve and being formed at said peripheral surface in the axial regions of said cage slots with recessed ball-pockets spaced from each other at equal angular intervals in a circumferential direction, said ball-pockets being of a depth smaller than the diameter of the coupling ball and adapted for receiving said coupling balls; a cylindrical closure sleeve coaxially surrounding said drive sleeve and held on said drive sleeve with a formation therebetween of an annular space; a thrust ring arranged in said annular space on an axial side of said coupling balls, said thrust ring being adjustably supported by thrust springs axially in the direction towards said cage slots and being pressable against said coupling balls, said cage slots being substantially inclined towards a working drive direction of said drive sleeve, said closure sleeve having in the axial region of said cage slots in an interior an annular groove the bottom of which extends at a radial distance corresponding at least to the diameter of the coupling ball from said peripheral surface of the drive shank, the improvement comprising said cage slots being arranged in the circumferential direction of said drive sleeve in pairs and following closely adjacent one after another, one cage slot in a pair having an angular width which is substantially as great as the diameter of the associated coupling ball, and another cage slot in the pair, which follows closely adjacent said one cage slot, having an angular width which is substantially greater than the diameter of the associated coupling ball; and an annular elastic element arranged in the annular space between the closure sleeve and the drive shank, said elastic element, in operation of said ball-pocket coupling exerting on the respective coupling ball radially displaced from the associated ball pocket into said annular groove and positioned between said peripheral surface of said drive shaft and said annular groove of said closure sleeve a prestressed radial force.

4,599,020

DEBURRING SYSTEM

Michael D. Colburn, Mt. Clemens, Mich., assignor to Cargill Detroit Corporation, Clawson, Mich.

Filed Aug. 23, 1984, Ser. No. 643,435
Int. Cl.⁴ B23B *51/00*
U.S. Cl. 408—211 **8 Claims**



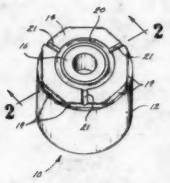
1. Deburring system comprising deburring station having rotary head with means for axial positioning displacement, first tool shank mounted within said head having tool holder with axially resilient axial tool holding means, deburring tool shank in said tool holder capable of resilient axial displacement when said first tool shank is at a fixed axial position, deburring means in the end of said deburring tool shank radially displaceable therein with means for producing radial retraction during entry and passage through a drilled workpiece hole and radial extension to a deburring position upon completing passage through said hole, said hole having an irregular edge to be deburred extending outside of a plane normal to the hole axis, said deburring means having a deburring edge for reacting axially at the edge of said workpiece hole against the resilient bias of said tool holding means to produce axial displacement in either direction of said deburring tool shank to accommodate continuous deburring hole engagement while following an axially varying hole edge path during deburring rotation of said shanks.

4,599,021

RETAINING NUT FOR MACPHERSON STRUT SUSPENSION ASSEMBLY

Kenneth D. Kloster, 6649 Millridge, Maumee, Ohio 43537

Filed Mar. 16, 1983, Ser. No. 475,893
Int. Cl.⁴ B23B *51/00*
U.S. Cl. 408—221 **1 Claim**



1. An apparatus for retaining a shock absorber unit within a cylindrical shroud of a shock absorber assembly wherein the shock absorber unit includes a piston rod axially extending from the upper end of the cylindrical shroud, said apparatus comprising:

a one piece main body including a hollow cylindrical portion provided with means for threadedly attaching said main body to the upper end of the cylindrical shroud, said main body further including an integral top wall located at the upper end of said hollow portion, said top wall having a centrally located piston rod aperture formed therein for receiving the piston rod of the shock absorber unit; and

channel means formed in said top wall, said channel means including an upwardly facing annular channel substantially circumscribing the piston rod aperture and at least one upwardly facing radial channel extending generally outwardly from said annular channel to the periphery of said top wall for removing liquid which accumulates on the upper surface of said top wall.

4,599,022

CLAMP PROFILING CONTROL METHOD

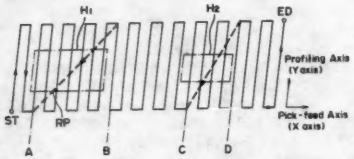
Etsuo Yamazaki, Hachioji, Japan, assignor to Fanuc Ltd., Tokyo, Japan

PCT No. PCT/JP82/00370, § 371 Date May 13, 1983, § 102(e) Date May 13, 1983, PCT Pub. No. WO83/01032, PCT Pub. Date Mar. 31, 1983
PCT Filed Sep. 14, 1982, Ser. No. 498,191
Claims priority, application Japan, Sep. 14, 1981, 56-145330
Int. Cl.⁴ B23Q *35/06*
U.S. Cl. 409—84 **5 Claims**

1. A clamp profiling control method in which a stylus is made to alternately perform a profiling feed operation and a pick-feed operation along only one direction of a profiling path, and a profiling starting point return operation, and in which clamp feed is initially performed at an initial set clamp level, said method comprising the steps of

specifying a clamp region by storing a starting position at which the clamp feed at said initial set clamp level first occurs and an ending position at which the clamp feed at said initial set clamp level subsequently ceases during the course of said profiling feed in said one direction along said profiling path,

successively executing repetitive clamp profiling control over said clamp region, in said one direction along the respective portion of said profiling path between said starting and ending positions, while respectively increasing the clamp level for each said clamp profiling control, wherein, after each said clamp profiling control over said clamp region for which said clamp feed at the respective clamp level occurs,



a rapid traverse of said stylus is provided from said ending position to said starting position, and

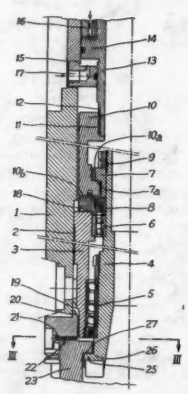
discriminating that the clamp feed is no longer performed during the course of profiling feed of said repetitive clamp profiling control within said clamp region, setting the clamp level to said initial set clamp level, and proceeding further along said profiling path.

4,599,023

DEVICE FOR MOUNTING A TOOL-HOLDER

René Poincenot, Larchant, France, assignor to Berthiez-Saint-Etienne, Saint-Etienne, France

Filed Dec. 13, 1984, Ser. No. 681,379
Claims priority, application France, Dec. 16, 1983, 83 20225
Int. Cl.⁴ B23C *5/26*
U.S. Cl. 409—233 **8 Claims**



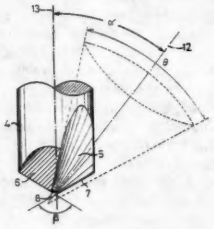
1. A device for mounting and releasing a turning or milling tool holder by its upper face to the seat of the slide body of a machine tool which comprises: a sleeve within an axial bore of said slide body mounted for axial displacement therein; a rotatable spindle mounted within said sleeve for axial displacement therewith; a transmission member also mounted for axial displacement within said bore one end of which is connected to a source of displacement power, the other end of which is adapted to transmit its axial displacement in one direction through one end of said sleeve and in the other direction through one end of said spindle; and means at the other end of said spindle adjacent the seat of said slide body adapted to cooperate with means on said tool holder for coupling the latter by its upper face to the seat of said slide body, the upper face of said tool holder being brought into a coupling relationship with the seat of said slide body by the axial displacement of said spindle by said transmission member and released therefrom by the axial displacement of said sleeve by said transmission member.

4,599,024

ENTERING END PORTION OF DRILL SCREW

Nariaki Sano, and Tetsuo Amano, both of Kyoto, Japan, assignors to Kabushiki Kaisha Yamashina Seikosho, Kyoto, Japan

Continuation-in-part of Ser. No. 399,253, Jul. 19, 1982, abandoned, which is a continuation of Ser. No. 2,365, Jan. 10, 1979, abandoned. This application Jan. 18, 1984, Ser. No. 571,713
Claims priority, application Japan, Jan. 18, 1978, 53-3456
Int. Cl.⁴ F16B *25/00*
U.S. Cl. 411—387 **6 Claims**



1. A drill screw comprising a shank, a head and an entering end portion formed integrally with one another, said shank having formed thereon thread convolutions of a substantially uniform outer diameter and a substantially uniform root diameter, said head being disposed at one end of said shank and provided with means for interengaging a tool for turning the drill screw, and said entering end portion being disposed at the other end of said shank, said entering end portion comprising a cylindrical portion coaxial with said shank, said cylindrical portion being provided with two flute surfaces inclined with respect to the center axis of said cylindrical portion and disposed on sides thereof and forming means effective to provide rapid discharge of chips produced during a drilling operation in the form of a coil, and end surfaces of a roof-shape formed in said cylindrical portion, wherein the improvement resides in each of said flute surfaces including an uninterrupted and at least part substantially conical flute surface having a vertex angle of 35° to 54°, the intersection of each of said flute surfaces and each of said end surfaces forming a cutting edge, each of said at least part conical surfaces extending from said cylindrical portion at least towards a respective one of said cutting edges, and each of said flute surfaces forming a rake angle with respect to one of said cutting edges, the vertex of each of said at least in part substantially conical flute surfaces being located outside of a first plane which is perpendicular to a second plane, said second plane being parallel and between the cutting edges, and said first plane including a center axis of said entering end portion, and each of said end surfaces forming a relief angle with respect to one of said cutting edges.

4,599,025

STACKER ASSEMBLY

Alvin Borsuk, Madison; Timothy G. Mally, Oregon, and James A. Rattmann, Sun Prairie, all of Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Apr. 16, 1984, Ser. No. 600,722
Int. Cl.⁴ B65G *57/10*
U.S. Cl. 414—82 **10 Claims**

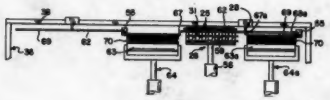
1. An apparatus for stacking conveyed products, comprising:

a product conveyor assembly having an on-feed portion and a transfer portion downstream of said on-feed portion;

an oscillating stacking comb assembly, said oscillating stacking comb assembly having a comb assembly and means for oscillating the comb assembly into and out of operative interengagement with said transfer portion of the product conveyor assembly;

a lifter assembly having upstanding portions and means for moving said upstanding portions between a lowered position below said transfer portion of the conveyor assembly and a raised position above said transfer position of the conveyor assembly and above the comb assembly, said upstanding portions being in operative interengagement with said transfer portion of the conveyor assembly and with said comb assembly at said raised position;

a discharge assembly having a product receiving and stacking portion; and



said means for oscillating the comb assembly includes means for moving the comb assembly between a location in alignment with said transfer portion of the product conveyor assembly and said receiving and stacking portion of the discharge assembly and wherein said oscillating stacking comb assembly includes a pair of said comb assemblies spaced from each other, further including a timing system for sequencing said comb assembly oscillating means and said lifter assembly moving means with respect to each other, wherein said timing system raises the upstanding portions to their raised position when said pair of comb assemblies straddle the upstanding portions, and wherein said timing system lowers the upstanding portions to their lowered position when one of said comb assemblies meshes with said raised upstanding portions.

4,599,026

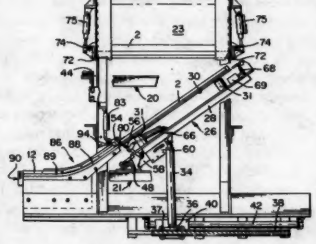
APPARATUS FOR PROVIDING A CONTINUOUS SUPPLY OF WORKPIECES

Wolfgang E. A. Feiber, Harrisburg; Ronald J. Capp, Enola, and Dwight A. Griffin, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 26, 1985, Ser. No. 705,597

Int. Cl.⁴ H05K *13/02*

U.S. Cl. 414—126 **9 Claims**



1. Apparatus for providing a continuous supply of workpieces to a pickup station, said workpieces being packaged in trays, each tray having a top surface bounded by a first end and an opposed open second end, said workpieces being in side-by-side rows on said top surface, each row having a plurality of workpieces aligned end-to-end, said apparatus comprising:

a frame having opposed first and second vertical ends;

a magazine in the top of said frame where trays are stacked, each tray being generally horizontal, the first end of each tray being proximate the first vertical end of said frame, the open second end of each tray being proximate vertical second end of said frame,

a pickup plate assembly having a first end and an opposed second end, said first end being pivoted at said first end of said frame proximate the bottom of said magazine, said assembly being pivotable from a generally horizontal pickup position paralleling the bottom of said magazine to an inclined delivery position;

a delivery station having a generally planar inclined surface which is substantially coplanar with the top surface of a tray and substantially contiguous with the open second end thereof when said pickup plate is in the inclined delivery position with a tray thereon.

4,599,027

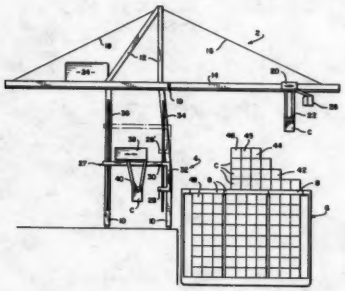
METHOD AND APPARATUS FOR MOVING CARGO BETWEEN A SHIP AND A DOCK

Richard N. Knapp, Norfolk, Va., assignor to Virginia International Terminals, Inc., Norfolk, Va.

Filed Mar. 15, 1985, Ser. No. 712,047

Int. Cl.⁴ B65G *63/00*

U.S. Cl. 414—139 **9 Claims**



1. In a quayside crane for moving cargo between a dock and a ship, said crane having a landing platform and a waterside trolley for moving cargo between the landing platform and ship, said waterside trolley being operable to lift cargo from and set cargo on said landing platform and ship, said crane also having a landside trolley for moving cargo between the landing platform and the dock, said landside trolley being at a lower elevation than the waterside trolley and being operable to lift cargo from and set cargo on said landing platform and dock, the improvement wherein said landing platform is vertically movable to positions at different elevations for handling different tiers of cargo on the ship and to change the extent of vertical movement performed on the cargo by each of the waterside and landside trolleys.

4,599,028

INSTALLATION FOR CHARGING A SHAFT FURNACE

René Mahr, Howald, and Emile Lonardi, Bascharage, both of Luxembourg, assignors to Paul Wurth S.A., Luxembourg, Luxembourg

Filed Sep. 30, 1981, Ser. No. 306,950

Claims priority, application Luxembourg, Oct. 10, 1980, 82840

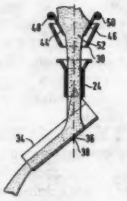
Int. Cl.⁴ F27B *11/20*

U.S. Cl. 414—206 **12 Claims**

1. A charging installation for a shaft furnace having at least

one storage chamber for material to be fed to the shaft furnace, the storage chamber having a vertical axis offset relative to the vertical axis of the shaft furnace, including:

rotating spout means for receiving material from said storage chamber and distributing said material to the shaft furnace; and



guide blade means upstream of said spout means and between the storage chamber and said spout means to control the fall of material from the storage chamber to said rotating spout about a predetermined axis.

4,599,029

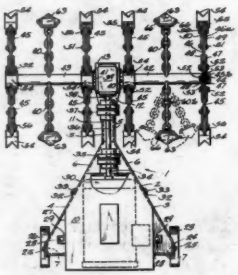
SILAGE-TUNNELING APPARATUS

Ronald L. Zyduck, Mosinee, Wis., assignor to Acorn Equipment Corp., Stevens Point, Wis.

Continuation of Ser. No. 421,747, Sep. 23, 1982, abandoned. This application Mar. 8, 1985, Ser. No. 709,833

Int. Cl.[4] B65G *65/00*

U.S. Cl. 414—297 **5 Claims**



1. Silage-tunneling apparatus adapted to cut through silage stored in a silo upon movement of the apparatus upwardly along the inside surface of the wall of the silo and thereby form a vertical tunnel extending through the silage to provide an opening for the discharge of silage through the bottom of the silo,

said silage-tunneling apparatus comprising, in combination:

(1) a skid forming a base for the apparatus;

(2) a motor and drive transfer means mounted on the skid;

(3) a horizontal drive shaft driven by the motor and said drive transfer means, the drive shaft having a first portion extending from said drive transfer means on one side of the skid and a second portion extending from said drive transfer means on a side opposite said one side of the skid;

(4) inner and outer hinged rigid cutter arms secured to each of the first and second portions of the drive shaft and extending radially therefrom,

each inner and outer cutter arm including at least one hinged section adapted to enable the arm to hinge radially upon contact with an obstruction, and having an inner end secured to the drive shaft and an outer end;

(5) at least one intermediate flexible cutter arm secured to each of the first and second portions of the drive shaft between the inner and outer hinged rigid cutter arms thereon,

each intermediate cutter arm being a flexible arm consisting of a plurality of chain links secured to one another, and having an inner end secured to the drive shaft and an outer end; and

(6) silage cutting means attached to the outer end of the inner and outer rigid cutter arms and flexible cutter arms.

4,599,030

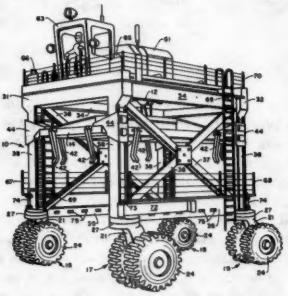
MARGINAL TERRAIN STRADDLE-LIFT CONTAINER HANDLER

Clifford I. Skaalen, Oxnard; Herman G. Lange, Camarillo, and Preston S. Springston, Oxnard, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 1, 1985, Ser. No. 718,762

Int. Cl.[4] B60P *3/00*

U.S. Cl. 414—460 **16 Claims**



1. A straddle carrier vehicle for handling standardized cargo containers and outsized loads over rough, unleveled and unprepared soils, comprising:

a. an inverted U-shaped rectangular frame structure consisting of a pair of vertically extending legs at either end and longitudinal upper and lower side beams at either side that define an elongated container carrying bay;

b. said U-shaped rectangular frame structure being supported at respective corners thereof by independent hydraulically operated transport assemblies each of which is operable to be independently rotated by 360 degrees about a respective steering axis of rotation for any variety of positioning and steering modes;

c. each said transport assembly including locomotion means, an offset yoke means attached to said locomotion means for locating the locomotion means at a distance offset from its steering axis of rotation, and independent hydrostatic drive motors for driving the locomotion means;

d. a cargo latch-on spreader frame means operable to be removably connected to said vertically extending legs and to be raised and lowered vertically the height of said legs, and locked into any desired position along said legs;

e. hoist means located on said straddle carrier vehicle operable to raise and lower said spreader frame means with and without cargo, and operable to separately hoist breakcargo loads without the use of said spreader frame means;

f. power supply means located on said straddle lift vehicle for operating said hoist means and said hydrostatic drive motors, and for positioning and steering said transport assemblies;

g. control means for said power supply means, including wheel position selectioning means located at an operator's console and wheel position indicator means located on said straddle carrier vehicle;

h. hinged transverse structure reinforcing means being pro-

vided fore and aft on said straddle vehicle and operable to be used for reducing torsion and bending moments of the vehicle structure, particularly when operated over rough and uneven terrain;

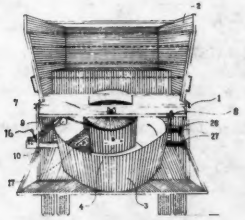
i. said offset yoke means and the independent 360 degree steering of each of said transport assemblies operating to allow the straddle lift vehicle wheelbase to be changed from normal to an extended wheelbase for severe terrain operations, and to a shortened wheelbase for close quarters; also, allowing positioning of said transport assemblies inboard for narrow passage transporting and outboard for normal operation, and at 90 degrees to normal for lateral movement of the straddle lift vehicle; and allowing conventional front steering as well as rear locomotion means sterring, oblique steering, crab steering, and tight radius steering for rotating the straddle lift vehicle within its own length.

4,599,031

TRASH COMPACTOR AND TRANSPORTING MECHANISM

Nathan L. Pickler, P.O. Box 528, Spencer, N.C. 28159

Filed Jun. 11, 1982, Ser. No. 387,505
Int. Cl.[4] B60P *1/00*
U.S. Cl. 414—507 **14 Claims**



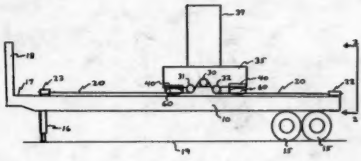
1. A portable bulk material compressor comprising a semi-cylindrical hopper, means disposed within said hopper to compress and transfer small volumes of refuse into a larger storage compartment, said means comprising a rotating cylindrical drum which is slotted to receive therethrough a sweeping blade which rotates integrally with said drum and one end of the sweeping blade contacts the inside wall of the hopper, creating a sweeping and compacting action as the sweeping blade rotates, the volume defined within the sweeping blade, rotating drum, and interior hopper walls constantly decreases as the said drum and blade turn through a complete cycle, the sweeping blade sliding by gravity and momentum through said rotating drum at the point the rotating drum contacts the hopper wall upon completing one compaction cycle, thus ending one compaction cycle and beginning a subsequent compaction cycle which creates a sweeping and compressing action of the refuse against the sides of said hopper; access means communicating the hopper with the storage compartment, said access means being normally held in a closed position by means of a spring which exacts a force against said access means, maintaining said access means in a closed position until the spring means force is overcome by the compacting force and the compressed refuse is transferred from the hopper means to the storage compartment.

4,599,032

ROLLING BASE FOR TRUCK CRANES

John C. Haus, Jr., Lancaster, Pa., assignor to U.S. Truck Cranes, Inc., York, Pa.

Filed Mar. 22, 1985, Ser. No. 714,909
Int. Cl.[4] B60P *1/54*
U.S. Cl. 414—542 **4 Claims**



1. The combination of a truck having a bed and a crane rolling base assembly thereon comprising:

a chain (**20**) having a first end (**23**) and a second end (**22**),

said first end being fixedly mounted to the forward end of said truck bed,

said second end being fixedly mounted to the aft end of said truck bed,

a rolling base (**35**) for carrying a truck crane (**39**) being mounted on said truck bed,

said rolling base having motor driven sprocket means (**30**) attached thereto,

said chain (**20**) being attached to said sprocket means at a position between the first and second ends of said chain,

said rolling base having roller assemblies (**60**) at the outboard portions thereof, and

means whereby said rolling base is caused to crawl along the length of said truck bed by movement of the driven sprocket means attached thereto and by rolling action of said roller assemblies,

wherein said roller assemblies (**60**) each have a housing means (**40**) therearound,

wherein said truck bed has at least one I-beam (**10**) running substantially the length of said truck bed,

wherein said housing means (**40**) has lower arms (**44, 45**) which are arranged in relation to said I-beam for movement along the length of said I-beam,

wherein said housing means (**40**) has first, second and third upper layers thereon,

said first layer (**41**) comprising high strength metal,

said second layer (**42**) comprising an isolation pad,

said third layer (**43**) comprising a high strength metal,

wherein said third layer (**43**) has mounted on the lowerside thereof said housing arm (**46**), said arms and layers being connected by biasing means, said housing arm (**46**) having lower arm extensions (**44, 45**) arranged to interact with an I-beam along the length of the truck bed,

wherein said third layer (**43**) has mounted on the underside thereof roller bearing support means (**48**),

wherein said roller bearing support means (**48**) have attached thereto a central bearing support means (**49**),

wherein the central bearing support means (**49**) has mounted thereon a plurality of needle rollers (**60**),

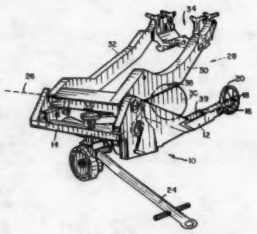
wherein a wear pad (**47**) is positioned between one of said lower arm's extensions (**45**) and said I-beam to prevent frictional wear engagement between said extensions and I-beam.

4,599,033

LIFTING APPARATUS

Dan Raz, Haifa, Israel, assignor to Electra Mikun (Industries) Ltd., Hod Hasharon, Israel

Filed Feb. 6, 1984, Ser. No. 577,261
Claims priority, application Israel, Feb. 8, 1983, 67864
Int. Cl.[4] B66F 3/22
U.S. Cl. 414—589 5 Claims



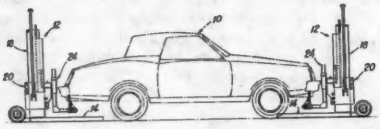
1. Lifting apparatus comprising:
a cradle arranged to support goods in a predetermined configuration; and
a lifting device arranged selectably to engage said cradle for lifting thereof to a desired height, said lifting device including:
a wheeled chassis;
cradle engaging lift arms pivotably mounted onto said chassis; and
means for moving said lift arms relative to said chassis to provide lifting of said cradle including:
a lever element interposed between at least one of said lift arms and said chassis, whereby the location of said lever element determined the extent to which said lift arms are raised with respect to said chassis;
cable means engaging said lever for selectable positioning thereof;
winch means operable to engage said cable means for selectable positioning of said lever element; and
emergency stop means associated with said lever element for preventing undesired movement of said lever element in the event of cable breakage including a track engagement block defining brake means adapted to engage said chassis in the event of cable breakage.

4,599,034

VEHICLE LIFT

Donald L. Kennedy, Adrian, Ga.; John P. Kennedy, Railroad Ave., Clarksville, Ga. 30523, and Peggy Kennedy, executrix, P.O. Box 286, Adrian, Ga. 31002

Filed Dec. 31, 1984, Ser. No. 688,051
Int. Cl.[4] B66F 7/00
U.S. Cl. 414—678 8 Claims



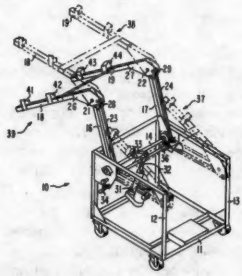
3. A vehicle lift for lifting and rotating vehicles, comprising:
(a) a frame for supporting the lift;
(b) a plurality of wheels connected to the frame for allowing the lift to be moved easily;
(c) an upright extending substantially vertically from the frame;
(d) a y-shaped follower track mounted on the upright;
(e) a carriage slidably connected to the upright;
(f) a plurality of openings formed in the upright and a pin for insertion in the openings for restraining the carriage from being inadvertently lowered down the upright;
(g) a collar mounted on the carriage;
(h) a vehicle support rack rotatably connected to the collar, comprising:
(i) a journal rotatably mounted in the collar;
(ii) a sleeve mounted in the journal;
(iii) a connector bar adjustably received in the sleeve for adjusting the vehicle support rack such that the center of gravity of the vehicle being lifted and rotated is substantially aligned with the journal and the collar, whereby the vehicle may be easily rotated and restrained from rotating;
(iv) an extender bar mounted substantially normal to the connector bar;
(v) a vehicle support bar mounted adjustably and substantially normal to the extender bar, for connection to the vehicle being lifted and rotated;
(vi) at least one chain and corresponding tensioner adjustably mounted on the vehicle support bar for securing the vehicle support bar to the vehicle;
(vii) a follower link mounted on the journal; and
(viii) a follower rotatably mounted on the follower link for being received in the follower track and thereby controlling rotation of the vehicle;
(i) a selector lever pivotally mounted in the divergence of the arms of the y-shaped follower track, to divert the follower into a preselected arm of the track and thereby cause the vehicle to rotate in a preselected direction; and
(j) an actuating means connected to the carriage and to the frame for causing the carriage to slide up and down the upright and lift and rotate the vehicle.

4,599,035

ARTICLE RAISING AND LOWERING APPARATUS

Albert P. Goodlad, Toms River, and Ralph De Stephanis, Middlesex, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jan. 25, 1985, Ser. No. 694,972
Int. Cl.[4] B66F 9/16
U.S. Cl. 414—697 7 Claims



1. An article raising and lowering apparatus comprising:
a multisided base member, two of said sides being facing and substantially parallel;
first lift arms each having one end individually, pivotally coupled to said facing sides in the proximity of an upper corner of said facing sides;
a first shaft extending between said first lift arms, said first lift arms being affixed to said first shaft, and said first moving means being coupled to said first shaft;
second lift arms individually, pivotably coupled to the free end of said first lift arms;

first moving means for simultaneously and bilaterally moving said first and second lift arms between raised and lowered positions whereby said first lift arms are substantially parallel to the tops of said facing sides, and said second lift arms are in the proximity of the tops of said facing sides when said apparatus is in said lowered position and said first moving means rotates said first shaft to effect motion of said lift arms between said raised and lowered positions;

second moving means for simultaneously and bilaterally moving said second arms between said raised position and an intermediate position; said first motion means being pivotally coupled to a lever attached to said first shaft;

said second moving means including a second shaft, a plurality of cams affixed to said second shaft, a plurality of actuating linkages individually coupled between said cams and said second lift arms, and means for rotating said second shaft to move said second arms between said raised and intermediate positions; and

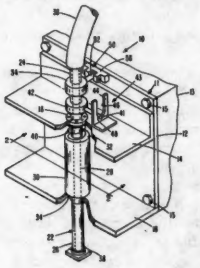
article carrier members arranged on said second lift arms whereby an article placed on said carrier members is bilaterally movable between all of said positions.

4,599,036

POSITIVE REGISTRATION COMPLIANT APPARATUS FOR ROBOTIC ASSEMBLERS

Robert R. Tarbuck, Ardmore, Pa., assignor to Sperry Corporation, New York, N.Y.

Filed May 17, 1984, Ser. No. 611,232
Int. Cl.[4] G01B 5/25
U.S. Cl. 414—730 **9 Claims**



1. A positive registration compliant apparatus for robotic assemblers comprising:

a support member having a bearing mount spaced apart from a shaped seat formed therein;

means for holding an electronic component and mounting said component on a printed circuit board, said holding means movably mounted on said support member and extending through said bearing mount, said holding means further having a portion correspondingly shaped for mating engagement with said shaped seat;

resilient means engaging said holding means and said support member for urging said shaped portion toward said shaped seat; and

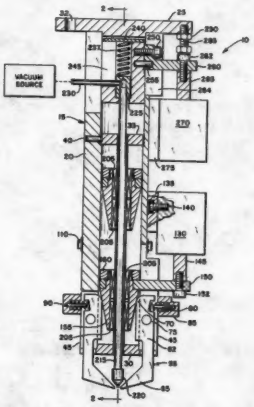
rotation limiting means associated with said support member and said holding means for limiting rotation of said holding means, said rotation limiting means including a probe connected to said movably mounted holding means, said probe extending into a tapered slot, formed in said rotation limiting means, said slot having a seat for engagement with said probe simultaneously with seated engagement of said holding means in said support member.

4,599,037

METHOD AND APPARATUS FOR MANIPULATING MINIATURE PARTS

Richard H. Ross, Jr., and Donald J. Longtin, both of Glastonbury, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 2, 1984, Ser. No. 627,369
Int. Cl.[4] B65G 69/00
U.S. Cl. 414—752 **16 Claims**



1. A manipulator for collecting parts from a first location for transport to, and deposit precisely at a remote, second location, said manipulator being characterized by:

a frame;

a suction means carried by said frame and including a nozzle for engaging said parts and restraining said parts from movement in a first direction;

a first pair of jaws which open and close in a second direction, said first pair of jaws being carried by said frame and operable by an actuator, for locating said parts in said second direction; and

a second pair of jaws which open and close in a third direction, said second pair of jaws being carried by said frame and operable by another actuator independently from said first pair of jaws for locating said parts in said third direction, whereby said jaws are capable of locating parts of diverse shape in said second and third directions with controllable force and minimal sliding contact between said part and said jaws.

4,599,038

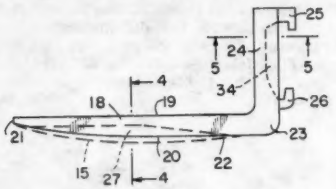
FORK FOR A LIFT TRUCK VEHICLE

Theodore L. Wolf, Chardon, Ohio, assignor to Jos. Dyson & Sons, Inc., Ohio

Filed Nov. 7, 1983, Ser. No. 549,649
Int. Cl.[4] B65G 47/00
U.S. Cl. 414—785 **2 Claims**

1. A fork for a fork lift truck having a forged body comprising a longitudinal load arm adapted to support a load and for connection at one end to a lift means, said body including an integral vertical lift arm extending from the load arm providing the connection aforesaid, said lift arm having a surface of parabola-like conformation in side elevation, the load arm is of unobstructed open-ended channel-like cross-section through-

out a substantial portion of its length, open at least at one end and having flanges extending throughout only at said substantial portion of its length, the flanges having the parabola-like edge conformation described.



4,599,039

METHOD OF ACCUMULATING STACKS OF PAPER SHEETS OR THE LIKE

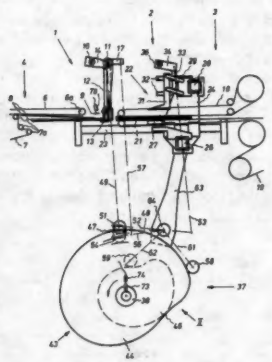
Siegmar Neubüser; Peter Dose, and Friedhelm Herrig, all of Hamburg, Fed. Rep. of Germany, assignors to E. C. H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 287,170, Jul. 27, 1981, abandoned. This application Oct. 6, 1983, Ser. No. 539,730

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1980, 3028540

Int. Cl.[4] B65H *31/30*

U.S. Cl. 414—786 11 Claims



1. A method of forming stacks of paper sheets or the like, comprising the steps of forming a succession of groups of overlapping sheets each containing a predetermined number of sheets; accumulating at least one first layer from a first number of successively formed groups; thereupon accumulating at least one second layer from a different second number of successively formed groups; and accumulating said first and second layers into a stack containing a total number of n sheets equal to z_1 times r times $p+z_2$ times r times q wherein r is the number of sheets in a group, z_1 is the number of groups in a first layer, p is the number of first layers, z_2 is the number of groups in a second layer and q is the number of second layers.

4,599,040

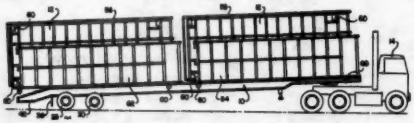
METHOD FOR TRANSPORTING CONTAINERS

Robert Rasmussen, Berlin, N.J., assignor to Accurate Industries, Inc., Williamstown, N.J.

Filed Feb. 22, 1983, Ser. No. 468,319

Int. Cl.[4] B60P *1/48*

U.S. Cl. 414—786 8 Claims



1. A method for transporting a plurality of large containers of the type including a floor, a left sidewall, a right sidewall and a front wall extending from the floor to define an open top, a removable rear door providing an open rear and at least one bottom rail affixed to the floor, on a trailer of the type having at least one main rail having a top surface and rollers below the top surface, comprising the steps of

stacking a first plurality of three containers together to form a first nest,

the stacking comprising orienting a first container with its floor in horizontal alignment and the second and third containers with their floors in vertical alignment, interleaving the second and third containers with their respective left sidewalls in mutual contact and contacting the floor of the first container with a left sidewall of one of the other two containers,

the stacking further comprising oppositely facing the at least one bottom rail of each of the second and third containers to the sides;

stacking a second plurality of three containers to form a second nest,

the stacking of the second plurality comprising orienting a first container of the second plurality with its floor in horizontal alignment and the second and third containers of the second plurality with their floors in vertical alignment, interleaving the said second and third containers with their respective left walls in mutual contact and contacting the floor of the said first container with a left sidewall of one of the other said two containers,

the stacking of the second plurality further comprising oppositely facing the at least one bottom rail of each of the second and third containers of the second plurality to the side;

constructing the forward portion of the trailer above the rearward portion of the trailer and causing the said at least one main rail to normally slope from front to rear to facilitate unloading procedures;

positioning the first nest upon a forward portion of the trailer and resting the bottom rail of the first container of the first plurality upon at least some of the rollers;

positioning the second nest upon a rearward portion of the trailer in longitudinal juxtaposition to the first nest and resting the bottom rail of the first container of the second plurality upon other of the rollers; and

moving the trailer in sloped orientation to simultaneously transport a plurality of six large containers.

4,599,041

VARIABLE CAMBER TANDEM BLADE BOW FOR TURBOMACHINES

John G. Stricker, 871 Highland Ave., Annapolis, Md. 21403

Filed Dec. 19, 1984, Ser. No. 683,448

Int. Cl.[4] F04D *29/36*

U.S. Cl. 415—130 12 Claims

1. A bidirectional thrust or flow device, comprising:

a casing;

support means disposed within said casing;

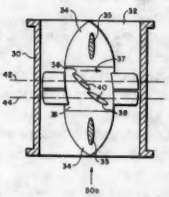
a first plurality of uncambered blades defining a first blade row;

first pivotal attaching means cooperating with each of said first plurality of uncambered blades for pivotally attaching said first plurality of uncambered blades to said support means;

at least a second plurality of uncambered blades defining at least a second blade row;

pivotal attaching means cooperating with each of said at least a second plurality of uncambered blades for pivotally attaching said at least said second plurality of uncambered blades to said support means and wherein said pivotal attaching means are tangentially offset from said first pivotal attaching means so that said first blade row is offset from said at least said second blade row; and

means cooperating with said first pivotal attaching means and said pivotal attaching means for pivoting said first plurality of uncambered blades and said at least said second plurality of uncambered blades respectively, said first plurality of uncambered blades pivotable over a first pitch angle range from a maximum (positive) pitch angle through a minimum (negative) pitch angle and said at least said second plurality of uncambered blades pivotable over a second pitch angle range from a maximum (positive) pitch angle through a minimum (negative) pitch angle, and wherein



said maximum (positive) pitch angle and said minimum (negative) pitch angle of said first pitch angle range do not equal said maximum (positive) pitch angle and said minimum (negative) pitch angle of said second pitch angle range, and wherein

any non-zero intermediate pitch angle setting of said first pitch angle range does not equal any intermediate pitch angle setting of said said second pitch angle range, and wherein

a first predetermined pitch angle setting in said first pitch angle range and a second predetermined pitch angle setting in said second pitch angle range causes each of said first plurality of uncambered blades to be aligned with a respective blade of said at least said second plurality of blades to define an energization slot therebetween, and wherein

said each of said first plurality of uncambered blades aligned with said respective blade of said at least said second plurality of blades in combination form a cambered blade configuration, whereby

a total flow turning angle of said bidirectional thrust or flow device is equal to an incidence angle of a working fluid and an absolute magnitude of a difference between said first and predetermined pitch angle setting and said second predetermined pitch angle setting.

4,599,042

FAN CASING VOLUTE

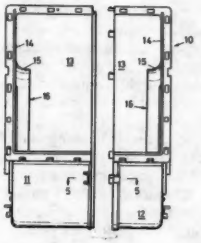
Anthony D. Colliver, St. Marys, Australia, assignor to Coolair Corporation Pte., Ltd., Singapore, Singapore

Filed May 18, 1984, Ser. No. 611,688

Claims priority, application Australia, May 18, 1983, PF9417

Int. Cl.[4] F03B *11/02*

U.S. Cl. 415—204 **3 Claims**



1. Improvements in a fan volute of a fan of the centrifugal blower type which comprises two volute portions, and means joining the volute portions to form a volute assembly,

each said volute portion being a monolithic moulding of polymeric material of dense foam sandwiched between impervious skins, and comprising an end plate with surfaces defining an air intake aperture, a hollow bearing housing in the aperture, and a plurality of arms extending outwardly from the bearing housing to the end plate thereby supporting the bearing housing from the end plate, each said arm being of generally U-shape in cross-section, the thickness of the polymeric material in each said volute portion being substantially constant throughout each respective said portion including throughout each said arm of generally U-shaped cross-section each said volute portion further having a bearing in the bearing housing, an annular ring of elastomeric material surrounding the bearing and engaging an inner surface of the bearing housing, and a bearing retainer retaining the bearing in the bearing housing, each said volute portion further having a cooperating boyonet lugs on the retainer and bearing housing.

4,599,043

CONTROLLABLE PITCH PROPELLER AND WATERCRAFT DRIVE

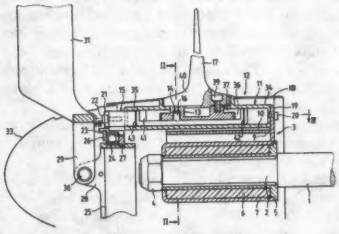
Peter Müller, Widmerstrasse 27, Zürich, Switzerland

Filed Sep. 11, 1984, Ser. No. 649,373

Claims priority, application Switzerland, Sep. 22, 1983, 5159/83

Int. Cl.[4] B63H *3/08*

U.S. Cl. 416—162 **9 Claims**



1. A controllable pitch propeller assembly for driving a watercraft comprising

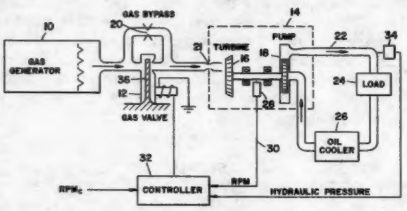
a main drive shaft;
housing means attached to said shaft for rotation therewith, said housing means including an inner and a plurality of separated outer housing portions attached to said inner housing portion;
a plurality of propeller blades;
a plurality of rotatable propeller hub means for rotatably supporting said blades for rotation about their own axes, each said propeller blade being associated with one of said hub means in a propeller-hub means assembly;
a plurality of adjusting mechanisms, one on each of said outer housing portions, each said mechanism being operatively associated with one of said propeller and hub means assemblies, each said adjusting mechanism including
a hub cylinder rotatably supporting one of said hub means, an adjustment piston,
first and second cylinder bushings integrally attached to said hub cylinder and extending from opposite sides thereof, said bushings forming a cylinder for said piston, said piston being longitudinally movable in the cylinder formed by both of said bushings, and
means coupling said piston to said hub means so that longitudinal movement of said piston rotates said hub means;
an adjustment lever; and
linkage means for connecting said lever to all of said piston so that movement of said lever concurrently moves said pistons and rotates said hub means and said propellers.

4,599,044

ELECTRONIC FEEDBACK AREA CONTROL SYSTEM FOR TVC GAS GENERATOR

Irwin S. Jacobson, Cupertino, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 7, 1985, Ser. No. 689,349
Int. Cl.[4] F04B *49/00*; F02C *3/26*
U.S. Cl. 417—42 **4 Claims**



1. In a thrust vector control system of the type in which a solid-propellant gas generator powers a turbine-driven pump for driving hydraulic actuators for controlling the direction of thrust, the improvement being a feedback control system comprising:

(a) an electromagnetically controlled flexure type gas valve capable of being controlled by pulse-duration modulation for providing a variable-area gas valve, said electromagnetically controlled valve being coupled between the output of said gas generator and the input to said turbine for adjusting the effective area seen by said gas generator at the output of said generator;

(b) means for measuring the speed of said turbine, said means for measuring providing an electronic signal indicating the speed of the turbine; and

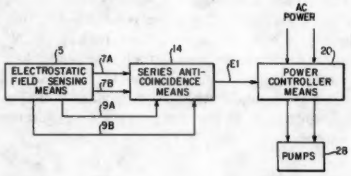
(c) electronic control means coupled to said means for measuring the speed of said turbine, said control means comparing the electronic signal indicating the speed of the turbine with an electronic signal indicating the commanded speed of said turbine, said electronic control means being coupled to said electromagnetically controlled gas valve for adjusting said effective area seen by said gas generator to drive the turbine speed toward the commanded speed.

4,599,045

SAFETY MEANS AND METHOD FOR THE HANDLING OF FLAMMABLE FLUIDS

Carlton M. Slough, Spring, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 16, 1985, Ser. No. 691,964
Int. Cl.[4] F04B *49/06, 49/10*; G01R *29/12*
U.S. Cl. 417—44 **7 Claims**



1. Apparatus for use in a flammable fluid distribution facility where tanker means load flammable fluid and transport it to one or more locations, comprising:

pump means for pumping the flammable fluid into the tanker means,

monitor means located outside of the tanker means for monitoring the tanker means at the distribution facility to sense a presence and a strength of an electrostatic field associated with the tanker means and providing a field signal representative of the field strength of the electrostatic field, and

control means connected to the monitor means and to the pump means for controlling the pumping of the flammable fluid into the tanker means in accordance with the field signal from the monitor means so as to prevent pumping of the flammable fluid when the field signal is indicative of an unsafe electrostatic field strength.

4,599,046

CONTROL IMPROVEMENTS IN DEEP WELL PUMPS

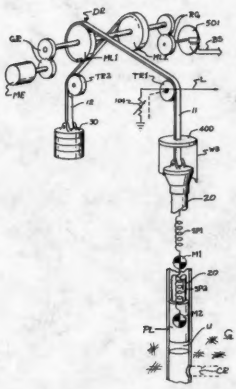
Robert G. James, Whittier, Calif., assignor to Armco Inc., Middletown, Ohio

Filed Apr. 7, 1983, Ser. No. 482,957
Int. Cl.[4] F04B *49/02, 49/06*; E21B *47/00*
U.S. Cl. 417—44 **13 Claims**

1. Apparatus for controlling the stroke rate of a reciprocation pump provided with a suspended pump rod, comprising:

sensing means operatively connected to sense the amplitudes of elastic motion of said pump rod, said elastic motion of said rod being characterized by a plurality of characteristic modes, said sensing means including isolating means conformed to select certain ones of said modes, for producing a sensing signal indicative thereof;

a variable prime mover connected to articulate said pump at a stroke rate corresponding to a control signal; and



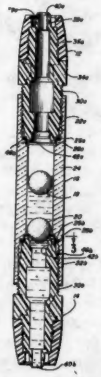
control means connected to receive said sensing signal and including inverting means for producting said control signal in substantially inverse relationship therewith.

4,599,047

CHEMICAL FEED PUMP FLOW INDICATOR

Duane D. Nowlin, New Brighton, and Raymond C. Walton, St. Paul, both of Minn., assignors to Ecodyne Corporation, Chicago, Ill.

Filed Nov. 2, 1984, Ser. No. 667,875
Int. Cl.[4] F04B *21/00*; G01F *15/00*
U.S. Cl. 417—63 **20 Claims**



1. A flow indicator for use in monitoring the operation of a feed pump and serially connected to the fluid input or output conduit of the feed pump, said flow indicator comprising: an indicator body having at least one flow chamber therethrough, said chamber having an inlet through which fluid flows into said chamber and an outlet through which fluid discharges from said chamber after flowing through said chamber, said inlet being in communication with said fluid conduit of said pump, and said outlet being spaced vertically relative to said inlet and in communication with said fluid conduit so that said chamber forms a vertical section of said conduit, said indicator body being at least partially transparent; a first freely movable body means disposed in said chamber in the flow path of said fluid and having a specific gravity lower than that of the fluid and a second freely movable body means disposed in said chamber in the flow path of said fluid and having a specific gravity greater than that of the fluid for permitting the relative movement of the first and second body means to indicate whether the feed pump and fluid conduit are operating properly; and seat means disposed at both said inlet for receiving said second body means and at said outlet for receiving said first body means, said seat means allowing said fluid to engage said first and second body means and a portion of said fluid to flow around said first and second body means.

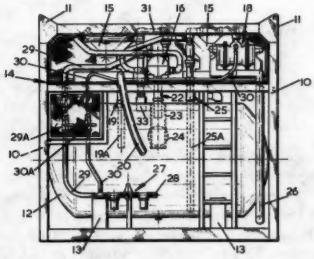
15. A chemical feed pump flow indicator serially connected to the fluid input or output conduit of a fluid feed pump for monitoring the operation of said pump, said flow indicator comprising: a first and second flow cylinder and an upper and lower manifold, said cylinders each having an inlet and an outlet, said lower manifold being in communication with said fluid conduit of said pump and with said inlets of said first and second flow cylinders, said upper manifold being in communication with said fluid conduit of said pump and with said outlets of said first and second flow cylinders; a first freely movable body disposed in said first flow cylinder in the flow path of the fluid and having a specific gravity lower than that of the fluid so that said first body floats to the top of the first cylinder when fluid fills said cylinder; and a second freely movable body disposed in said second flow cylinder in the flow path of the fluid and having a specific gravity greater than that of the fluid so that said second body sinks to the bottom of the second cylinder when fluid fills said cylinder, lifts off the bottom during the pumping stroke of said pump, and falls slowly back to the bottom during the time interval between each pumping stroke; said first and second cylinders being at least partially transparent.

4,599,048

INDUSTRIAL SUCTION APPARATUS

Robert C. Stewart, 'Lundy', Sauchen, Aberdeenshire, and Colin O. Hart, 17 Eastburn Road, Kintore, both of Scotland

Continuation of Ser. No. 488,464, Apr. 25, 1983, abandoned. This application Apr. 11, 1985, Ser. No. 722,192
Claims priority, application United Kingdom, Oct. 27, 1982, 8230673
Int. Cl.[4] F01B *25/02*
U.S. Cl. 417—85 **2 Claims**



1. Suction apparatus for reclaiming a slurry material such as drilling mud comprising:

a tank having an inlet;

conduit means communicating at one end thereof with said tank inlet;

a sweeping head connected to the free end of said conduit means and adapted to engage the slurry material;

a vacuum pump arranged to evacuate air from said tank to create a vacuum condition within said tank and enable slurry material to be conveyed from said sweeping head and through said conduit means into said tank through said tank inlet;

a gas supply conduit adapted for connection to a supply of pressurized gas;

a pressure gas operable motor connected to said gas supply conduit so as to be driven by said pressurized gas and drivingly connected to said vacuum pump;

a diaphragm type discharge pump connected to said gas supply conduit so as to be driven by said pressurized gas and arranged to effect discharge of slurry material from said tank; and

intake valve means in said conduit means between said sweeping head and said tank inlet operative to selectively control the flow of slurry material through said conduit means into said tank independently of the operation of said vacuum pump and of said discharge pump.

4,599,049

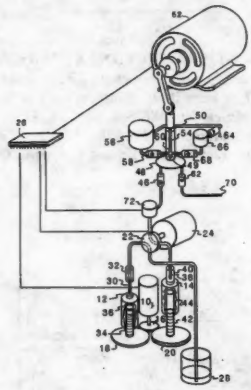
HIGH PRESSURE METER PUMP

Gary Gordon, Saratoga, and Kent Vincent, Cupertino, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 338,766, Jan. 11, 1982, abandoned. This application Jul. 2, 1984, Ser. No. 626,482

Int. Cl.[4] F04B *23/08, 35/02*

U.S. Cl. 417—205 31 Claims



1. A pumping system comprising:

first pumping means for metering fluid charges of a preselected volume, for incrementally subdividing said preselected volume into metered charges having a desired subvolume and for delivering said metered subvolume charges against a predetermined first pressure; and

second pumping means mechanically driven independently of said first pumping means and hydraulically interconnected with said first pumping means for receiving said metered subvolume charges and for delivering said metered subvolume charges to a load tube at a second pressure higher than said first pressure;

said second pumping means including pressure establishing means for providing said predetermined first pressure against which said first pumping means delivers said metered charges and insuring that no charge is drawn into said second pumping means from said first pumping means by action of said second pumping means.

4,599,050

DEVICE FOR CONTROLLING DISPLACEMENT OF VARIABLE DISPLACEMENT HYDRAULIC PUMP

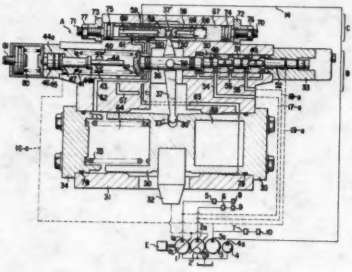
Naoki Ishizaki, and Koichi Morita, both of Kamakura, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Feb. 5, 1985, Ser. No. 698,470

Claims priority, application Japan, Feb. 8, 1984, 59-15364

Int. Cl.[4] F04B *49/00*

U.S. Cl. 417—216 1 Claim



1. A device for controlling displacement of at least one variable displacement hydraulic pump comprising a displacement control system for receiving a discharge pressure of said variable displacement hydraulic pump and a discharge pressure of a fixed displacement hydraulic pump to control the displacement of said variable displacement hydraulic pump, wherein said displacement control system comprises in a housing:

a servopiston including a helical compression spring for maintaining said variable displacement hydraulic pump at a maximum swash angle in a neutral position of an associated operating valve,

a servovalve including a spool for selectively controlling communication of hydraulic pressure between a control pump and a pair of fluid chambers defined in said servopiston,

a control piston connected through a control lever pivotably supported by a pivot pin to said spool and said servopiston,

an input signal section for receiving the delivery pressures of said fixed and variable displacement hydraulic pumps,

at least two helical compression springs for biasing said control piston and controlling torque and flow so as to approximate same to a constant torque curve,

a floating spring seat interposed said helical compression springs, and

a guide rod for guiding said floating spring seat and accommodated in a bore formed in the housing at a base portion thereof to define a pressure chamber, said pressure chamber being communicated through a conduit to a discharge passage of said fixed displacement hydraulic pump, and said guide rod being spring biased toward the control piston so as to reduce the pressure chamber.

4,599,051

VANE TYPE ROTARY PUMP

Akio Numazawa, Toyota; Keiichi Nakamura, and Toshifumi Sakai, both of Kariya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Aug. 27, 1985, Ser. No. 769,968

Claims priority, application Japan, Aug. 28, 1984, 59-180138

Int. Cl.[4] F04B *49/08, 49/10*

U.S. Cl. 417—293 2 Claims

1. A vane type rotary pump comprising:

a stator housing;

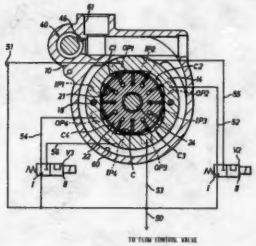
a cam ring mounted within said stator housing and having an inner peripheral wall defining four circumferentially equi-spaced semicylindrical inner cam surfaces;

a pair of end wall structures fitted to the opposite ends of said cam ring to form a pump cavity in said cam ring;

a drive shaft rotatably mounted within said stator housing and extending into the interior of said pump cavity through one of said end wall structures;

a rotor contained within said pump cavity and mounted on said drive shaft for rotation therewith; and

a plurality of circumferentially equi-spaced vanes slidably fitted in the body of said rotor to move radially outwardly and cooperating with the semicylindrical inner cam surfaces of said cam ring and with the inner end surfaces of said end wall structures to form four pairs of circumferentially equi-spaced suction and delivery chambers;



wherein one of said end wall structures is formed therein with four pairs of circumferentially spaced suction and delivery ports in communication with said respective suction and delivery chambers, and wherein a pair of changeover valves are disposed within a pair of delivery passages in connection to a pair of the diametrically opposed delivery ports to connect said delivery passages to the suction ports associated with the diametrically opposed delivery ports in their activated conditions and to disconnect said delivery passages from the suction ports in their deactivated condition.

4,599,052

CONTROL DEVICE FOR METERING PUMP

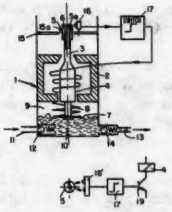
Herbert Langen, Altbach, and Fritz Reuter, Esslingen, both of Fed. Rep. of Germany, assignors to J. Eberspächer, Fed. Rep. of Germany

Filed Mar. 21, 1985, Ser. No. 714,694

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1984, 3410529

Int. Cl.[4] F04B *17/04*; H01H *47/24*

U.S. Cl. 417—413 **2 Claims**



1. A fuel pump comprising a pump housing having a free chamber, a displacement media chamber adjacent said free chamber, a diaphragm between said free chamber and said displacement media chamber, a pump piston having one end connected to said diaphragm and having an opposite end, a control head member connected to said opposite end of said pump piston and having an edge which is movable between two end positions with movement of said pump piston between two end positions, said control head member having a reflective surface, a phototransistor control fixed to said housing at a position between said two end positions of said control head member edge, said phototransistor control including a light source and a light receiver both facing said control head member for reflecting light of said light source onto said light receiver from said reflective surface, inlet and outlet means connected to said displacement media chamber for receiving and discharging media with backward and forward movement of said piston pump to pump media through said inlet means and said outlet means, electromagnetic drive means including a coil and connected to said pump piston for moving said pump piston backwardly and forwardly, and R-C time function delay elements connected to said light receiver for delaying a signal from said light receiver in response to passage of said reflective surface of said control head member, and a threshold switch having an input connected to said delay element and an output connected to said coil for powering said coil upon receiving said delayed signal to move said pump piston.

4,599,053

DISPLACEMENT PUMP FOR ABRASIVE AND DIFFICULT TO PUMP FLUIDS

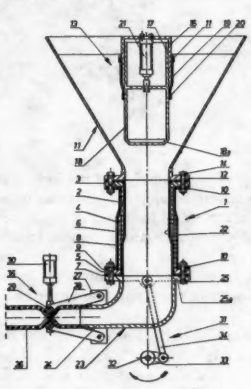
Bernhard Fejmert, Nordostpassagen 19, S-413 11 Göteborg, Sweden

PCT No. PCT/SE83/00324, § 371 Date May 2, 1985, § 102(e) Date May 2, 1985, PCT Pub. No. WO85/01085, PCT Pub. Date Mar. 14, 1985

PCT Filed Sep. 5, 1983, Ser. No. 732,000

Int. Cl.[4] F04B *19/02*

U.S. Cl. 417—437 **3 Claims**



1. A displacement pump, in particular for an abrasive and difficult to pump medium such as concrete, comprising a pump chamber formed from a first stationary tubular slide means and a second movable tubular slide means, a supply means for the medium connected to the first slide means, outlet means for the medium connected to the second slide means, said second slide means being in a sliding relationship supported by the first slide means, driving means connected to the second slide means for moving the second slide means forwards and backwards relative to the first slide means so as to produce a cycle of compression and suction strokes, wherein the walls of the two tubular slide means are enclosed between an inner sleeve of a soft, elastic material such as rubber provided inside the pump chamber covering the walls of the chamber and a contact surface between the two slide means and an outer sleeve of a flexible, elastic material such as rubber provided around the two slide means so that they are enclosed between said inner and outer

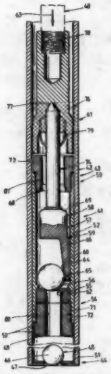
sleeves in such a manner that the contact surface between the two slide means is fully enclosed, and a lubricant placed inside a space between the sleeves, said sleeves being free from attachment to said walls along essentially the entire distance between attachment points of said sleeves, each attachment point being positioned at a distance from the contact surface between the two slide means, and said sleeves having a length which corresponds essentially to the distance between the points of attachment when the two slide means are in their most compressed position so that the sleeves, which are capable of elastic extension, will be subjected to extension with elastic stretching only when the slide means are working.

4,599,054

TRAVELLING VALVE ASSEMBLY FOR A FLUID PUMP

Harry L. Spears, 6307 Glenhill, Spring, Tex. 77379

Filed Aug. 23, 1984, Ser. No. 643,843
Int. Cl.[4] F04B *39/10, 7/00*
U.S. Cl. 417—456 **19 Claims**



1. A travelling valve assembly, for use in a sucker-rod actuated fluid pump having a pump barrel having upper and lower ends with a standing valve disposed in the lower end of the pump barrel and a moveable piston disposed within the pump barrel, comprising:

a housing having upper and lower ends, said housing adapted to be disposed within the upper end of the pump barrel;

a valve seat disposed in the lower end of the housing above the piston within the pump barrel;

a ball valve disposed above the valve seat and having a first open, fluid transmitting position with respect to the valve seat and a second sealed, fluid non-transmitting position with respect to the valve seat;

a ball valve actuator having upper and lower ends and generally disposed above the ball valve within the housing, the actuator having at least one downwardly depending member at its lower end which said at least one member has an actuation surface thereon for selective engagement with the ball valve; and

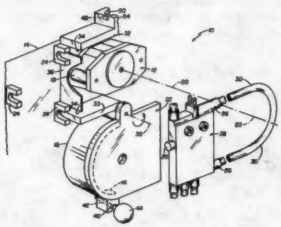
means for selectively moving the actuator and the at least one depending member from a first position, where the actuation surface of the at least one member engages the ball valve and moves the ball valve into the first open, fluid transmitting position with respect to the valve seat, to a second position where the actuation surface is spaced from the ball valve, whereby the ball valve is in the second sealed, fluid non-transmitting position with respect to the valve seat.

4,599,055

PERISTALTIC PUMP

Raymond C. Dykstra, Boulder, Colo., assignor to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Jun. 25, 1985, Ser. No. 748,578
Int. Cl.[4] F04B *43/12*
U.S. Cl. 417—477 **3 Claims**



1. A peristaltic pump comprising

a base,

a rotor rotatably mounted about a rotor axis and carrying rollers that travel in a circular path,

a race with an internal surface for supporting a flexible tube being squeezed by said rollers traveling in said circular path, said race being pivotally mounted on said base to move between an operating position in which said surface is adjacent to and concentric with said circular path and a tube loading position in which said surface is spaced from said circular path, and

means to lock said race in said operating position, said means to lock comprising a spring-biased pin carried by said race, and a cam surface leading to a depression on said base, said cam surface being positioned to cam said pin as said race is pivoted into said operating position, said pin being biased into said depression when in said operating position.

4,599,056

UNIVERSAL JOINT AND PROGRESSIVE CAVITY TRANSDUCER USING THE SAME

Gary M. Crase, Cypress, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Continuation of Ser. No. 461,937, Jan. 28, 1983, abandoned. This application Dec. 19, 1984, Ser. No. 683,730
Int. Cl.[4] F03C *2/00*; F16D *3/04*
U.S. Cl. 418—48 **1 Claim**

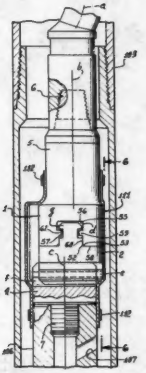
1. A progressive cavity in-hole adapted for connection to a bit and a drill string, said in-hole motor including, a housing, a stator in said housing, a helicoidal rotor positioned in said stator, a shaft adapted for connection to a drill bit, and a universal joint connected between the rotor and shaft, said universal joint comprising:

a driving member having a substantially cylindical portion providing a first circular crossectional surface having integrally formed therein, a "V" shaped entry way leading to first and second rectangular channels, said first and second channels being defined by respective, opposing first rectangular projections such that the width of said first channel is greater than the width of said second channel.

a driven member having a substantially cylindrical portion

providing a second circular crossectional surface having integrally formed therein, a "V" shaped entry way leading to third and fourth rectangular channels, said third and fourth channels being defined by respective, opposing second rectangular projections such that the width of said third channel is greater than the width of said fourth channel.

an idler member comprising a substantially cylindrical member having first and second tenons formed integrally on



opposite circular crossectional end surfaces thereof, said tenons, respectively, comprising first and second bars, said first and second bars being disposed perpendicularly to one another, each said bar having oppositely disposed U-shaped channel means therein each disposed for surrounding one of said first and second rectangular projections in a complimentary, spaced apart relation, and wherein the top surface of each said first and second bar has first and second beveled surfaces thereon.

4,599,057

ROTARY BLADE MACHINE WITH BLADE END SEALING

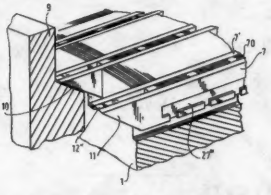
Ludovicus H. Baghuis, AA Den Bosch, Netherlands, assignor to Van Mullekom Innovation B.V., Netherlands

PCT No. PCT/NL84/00007, § 371 Date Oct. 17, 1984, § 102(e) Date Oct. 17, 1984, PCT Pub. No. WO84/03330, PCT Pub. Date Aug. 30, 1984

PCT Filed Feb. 23, 1984, Ser. No. 673,744

Int. Cl.⁴ F01C *1/00, 19/00*

U.S. Cl. 418—146 **23 Claims**



1. In a rotary blade machine for displacing fluids and comprising the combination of a rotor, a plurality of blades carried by the rotor and a stator enclosing the rotor, the improvement wherein said rotor is of a predetermined axial length presenting an outer surface provided with a circumferentially spaced series of slots each extending throughout the axial extent of said rotor, said blades being slidably disposed in said slots and each presenting an outer edge having a length greater than the axial length of said rotor so that each blade presents opposite ends of its outer edge which project beyond the respective opposite ends of the rotor, said stator having an inner surface surrounding said rotor and having a width extending axially relative to said rotor commensurate with the length of said outer edges of said blades and sealingly engaging such outer edges throughout the lengths thereof and said inner surface being contoured relative to said outer surface of said rotor to cause said blades to reciprocate within said slots as the rotor is rotated within said stator, said stator including wall means at each axial end of said rotor for defining a chamber at each axial end of said rotor of circumferentially uniform cross-section substantially conforming to and closely accomodating the ends of all the blades projecting beyond the corresponding axial end of said rotor, and means for preventing leakage of fluid along said opposite ends of the blades within said chambers.

4,599,058

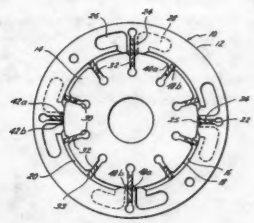
VANE SLOTS FOR A FLUID POWER CONVERTER

Stephen R. Stone, San Antonio, Tex., assignor to Rineer Hydraulics, Inc., Corpus Christi, Tex.

Filed Aug. 31, 1984, Ser. No. 646,661

Int. Cl.⁴ F04C *18/00*

U.S. Cl. 418—221 **6 Claims**



1. In a fluid power converter having a rotor and a stator member, the members being concentrically mounted and rotatable one with respect to the other about a common center, said members having opposing peripheries contoured to provide an annular space therebetween, each of said peripheries including a plurality of spaced radially extending slots receiving a vane therein, each of said vanes having sides which are entirely straight a fluid inlet in the stator adjacent one side of each stator slot and opening into the annular space, a fluid outlet in the stator adjacent the second side of each stator slot and opening into the annular space, the improvement comprising,

a ramp on at least one of the rotor and stator on the trailing sides of the open ends of each slot, said ramps being directed outwardly towards the annular space for allowing a crossing vane to cam out of the slot.

4,599,059

ROTARY COMPRESSOR WITH NON-PRESSURE ANGLE

Song K. Hsu, 4/F 27 Lane 160, Hsin Sheng S. Rd., Sec. 1, Taipei, Taiwan

4/F 27 Lane 160, Hsin Sheng S. Rd., Sec. 1, Taipei, Taiwan

Continuation-in-part of Ser. No. 327,206, Dec. 3, 1981, abandoned. This application Aug. 20, 1984, Ser. No. 642,243

Int. Cl.⁴ F01C *21/10*

U.S. Cl. 418—236 **5 Claims**

1. A rotary compressor comprising:

a housing having upper and lower end covers for closing longitudinal ends of the housing:

a cylindrical stator firmly fixed within said housing:

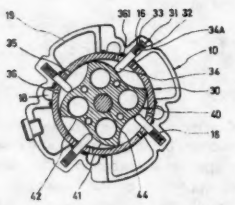
a driving means provided at the lower end cover of said housing;

a rotor concentrically mounted within said cylindrical stator defining a plurality of stator chamber between the inner

surface of said cylindrical stator and the outer peripheral surface of said rotor, the shaft of said rotor connected to said driving means, said rotor having a plurality of compressive wavy surfaces on the outer peripheral surface thereof, each said wavy compressive surface including a complete working cycle of continuous and smooth wavy surface, each having a regular alternating sinusoid convex wave surface and a sinusoid concave wave surface contiguous therewith;

a sharp curved rotor edge formed between each two wavy compressive surface of said rotor oriented in a direction opposite to the direction of the rotor movement, which is formed by the connection of the head portion of said sinusoid concave wave surface and the tail portion of said sinusoid convex wave surface with respect to the direction of the rotor movement;

a plurality of gas-blocking vanes equiangularly disposed in said housing and extending into said cylindrical stator, the inner ends of said gas-blocking vanes being adapted to engage with said wavy compressive surface of said rotor in contractibly and extensibly sliding contact for the purpose of air-tight sealing so that each of said stator chambers is divided into a first and second working chamber wherein the centerline of each said vane is oriented to be offset from the center of said rotor whereby during operation when the inner end of each said vane engages with a portion of the sinusoid concave wave surface of said wavy compressive surface of said rotor and extends to said stator chamber due to said concave wave surface inducing



said vane inwardly to said stator chamber, side thrust is reduced to zero during a half cycle of suction working in said stator chamber, and when the inner end of each said vane engages with a portion of the sinusoid convex wave surface of said wavy compressive surface of said rotor, said vane begins to contract outwardly by the rotation movement of said convex wave surface of said rotor and causes the centerline of the path of the vane to overlap with the common normal line of the contacting point of convex wavy surface of the rotor and the vane so that the pressure angle of said vane with respect to said wavy compressive surface of the rotor approaches 0° during a next half cycle of compression working in said stator chamber;

a separate suction chamber provided between said housing and said cylindrical stator adjacent each vane at a position subsequent to the vane in the direction of rotor movement;

an inlet port near each vane at a position subsequent to the vane in the direction of rotor movement and communicating with said first working chamber and said suction chamber;

a delivery chamber provided between said housing and said cylindrical stator adjacent each vane at a position in advance of the vane in the direction of rotor movement; and

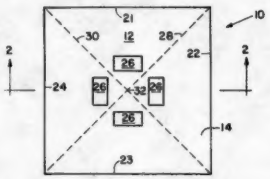
a delivery port near each vane at a position in advance of the vane in the direction of rotor movement and communicating with said second working chamber and said delivery chamber.

4,599,060

DIE-TARGET FOR DYNAMIC POWDER CONSOLIDATION

John E. Flinn, Idaho Falls, and Gary E. Korth, Blackfoot, both of Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 27, 1985, Ser. No. 749,373
Int. Cl.[4] B29C 7/00
U.S. Cl. 425—1 **20 Claims**



1. A die/target for consolidation of a powder to produce monolithic members by the dynamic action of a shock wave, such die/target comprising

means forming a metal block having a primary surface for receiving the shock wave,

such primary surface having at least one mold cavity formed therein to receive powder to be consolidated,

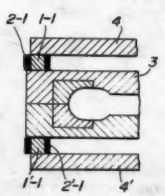
the cavity being located away from the geometrical center of the primary surface to reduce the effect of reflected waves so as to avoid tensile cracking of the monolithic member formed by consolidation of the powder in the cavitiy by the shock wave.

4,599,061

HEATING DEVICE FOR USE IN VULCANIZING APPARATUS

Masahiro Manabe, Kyoto; Eiichi Nagafuchi, and Yoshio Nohara, both of Kodaira, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Sep. 24, 1985, Ser. No. 779,552
Claims priority, application Japan, Dec. 20, 1984, 59-192116[U]
Int. Cl.[4] B29H 5/02
U.S. Cl. 425—41 **10 Claims**



1. A heating device for use in a vulcanizing apparatus having a metal mold in which a green tire is vulcanized, comprising

at least three magnetic cores arranged equidistantly on an outer surface of said metal mold in a contact manner; and

at least three electromagnetic coils each wound around respective magnetic cores.

4,599,062

ENCAPSULATION MOLDING APPARATUS

Akira Konishi, Kyoto, Japan, assignor to Dai-Ichi Seiko Co., Ltd., Kyoto, Japan

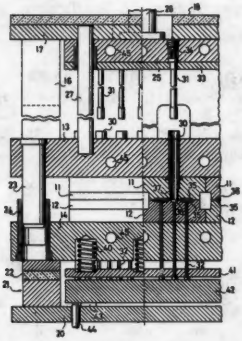
PCT No. PCT/JP82/00023, § 371 Date Nov. 9, 1982, § 102(e) Date Nov. 9, 1982, PCT Pub. No. WO82/02624, PCT Pub. Date Aug. 5, 1982

Continuation of Ser. No. 442,226, Nov. 9, 1982, abandoned. This PCT application Jan. 25, 1982, Ser. No. 682,471

Claims priority, application Japan, Jan. 26, 1981, 56-10766[U]; Jan. 26, 1981, 56-10767[U]

Int. Cl.⁴ B29C *45/02, 45/14*

U.S. Cl. 425—116 **5 Claims**



1. An encapsulating molding apparatus, comprising:

an upper mold, having a plurality of cavities;

a lower mold opposing said upper mold and having cavities corresponding to said upper mold cavities;

a plurality of pots disposed on one of said molds for supplying a plastic material or the like to said cavities;

a plurality of extruding plungers, each one slideable with a corresponding pot, said extruding plungers being supported by an extruding plate, and said extruding plate being connected to a rod of a pressure cylinder for moving said plungers within said pots; and

a plurality of gates exclusively connecting each one of said pots to a plurality of said cavities for conveying the plastic material to said cavities.

4,599,063

INJECTION MOLDING APPARATUS HAVING DIE CLOSING AND LOCKING MEANS

Lothar Gutjahr, Denzlingen, Fed. Rep. of Germany, assignor to Klöckner-Werke Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

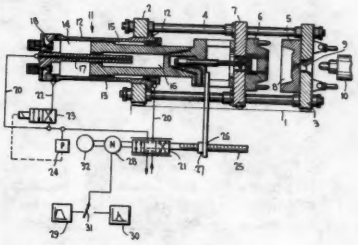
Filed Feb. 2, 1983, Ser. No. 463,112

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1982, 3203810

Int. Cl.⁴ B29C *45/68*

U.S. Cl. 425—150 **3 Claims**

1. An injection molding apparatus, comprising a pair of spaced, parallel support plates, guide rods affixed to and extending between said plates and lying parallel to a central axis thereof, a die plate mounted on said rods for sliding movement therealong, a fixed die mounted on one of said support plates, a movable die confronting said fixed die and being mounted on said die plate for movement therewith, a hydraulic piston and cylinder unit for moving said movable die relative to said fixed die during the molding operation, said unit comprising a hydraulic cylinder fixedly mounted on the other of said support plates and a piston connected to said movable die, said piston having a die closing chamber, said piston defining with said cylinder a die retracting chamber and a die-locking chamber, hydraulic means for operating said piston and cylinder unit, said means comprising a single hydraulic circuit to which said die closing and retracting chambers are connected, said circuit having a hydraulic branch line leading to said die-locking chamber, a linear amplifier having hydraulically fixed feedback and comprising a first multi-directional control valve in said circuit and being mounted for shifting movement to control the flow of hydraulic fluid through said circuit for closing and opening said movable die, an elongated threaded rotatable spindle threadedly connected with said die plate for axial displacement relative thereto upon rotation of said spindle, said first valve being mounted on said spindle for shifting together



therewith upon spindle rotation, a stepping motor coupled with said spindle for rotation of said spindle so as to thereby shift said first valve for initiating at least one of a preselected rate of travel of said piston and the pressure variation of said piston and cylinder unit, whereby rotation of said spindle effects the movement of said first valve to control the flow of hydraulic fluid, the movement of said movable die effecting an oppositely directed movement of said first valve via said spindle which is counteracted by said motor, and a second multi-directional control valve in said branch line for directing the hydraulic fluid into said die-locking chamber upon the closing of said movable die.

4,599,064

INJECTION MOLDING APPARATUS

H. Richard Landis, and Charles A. Webster, both of Oak Lawn, Ill., assignors to Landis Plastics, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 602,400, Apr. 20, 1980, Pat. No. 4,563,149. This application Jul. 13, 1984, Ser. No. 630,653

The portion of the term of this patent subsequent to Jan. 7, 2003, has been disclaimed.

Int. Cl.⁴ B29C *45/22*

U.S. Cl. 425—185 **9 Claims**

1. In a hot runner plastic injection mold assembly for producing a heated flow of plastic into a mold cavity comprising:

a mold housing comprising a plurality of mold frame plates and a mold cavity with an orifice from which discharges molten plastic into the mold cavity,

a heated manifold block of one piece, integral construction disposed within said housing having manifold channels therein for distributing hot plastic, and heater receiving passageways therein,

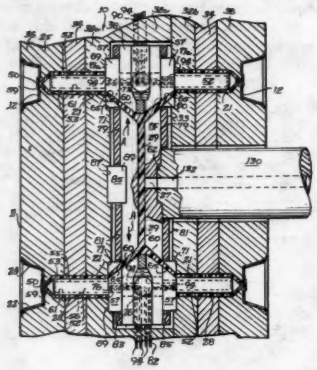
said manifold block being mounted internally within said mold frame plates and being spaced from portions thereof by clearance spaces allowing the manifold block to expand relative to said mold frame plates when plastic is passing therethrough,

said mold housing having a plastic injection bore therein,

a heater probe having an elongated outer sheath and a heater means disposed internally within said sheath, said sheath being disposed in said plastic injection bore and having an elongated front portion proportioned to extend to adjacent said discharge orifice leaving a surrounding passageway region in said injection bore for flow of plastic about the sheath and an integral rear portion thereon, said probe

heating the plastic flowing through said surrounding region,

means for securing said heater probe stationary relative to said housing during relative shifting movement of surfaces of said manifold block, and



an outer plate on said mold housing having opening therein aligned with each of said heater probes and each receiving a rear portion of a heater probe therein to allow removal of said probes through said internal manifold and from said mold housing without disassembly of the mold housing.

4,599,065

APPARATUS FOR DIMENSIONING SLIDE FASTENER COUPLING ELEMENTS

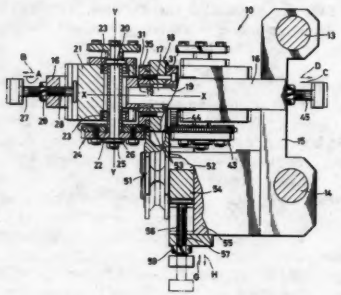
Kihei Takahashi, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed May 14, 1985, Ser. No. 733,885

Claims priority, application Japan, May 17, 1984, 59-99556

Int. Cl.[4] B29D *5/00*

U.S. Cl. 425—394 **7 Claims**



1. An apparatus for dimensioning slide fastener coupling elements, comprising:

(a) a base;

(b) a pair of first and second shafts rotatably mounted on said base and extending in a common plane and transversely to each other;

(c) a first presser roll rotatably supported on said first shaft and having a circumferential wall of a substantially L-shaped cross section composed of a first presser surface lying transversely to said first shaft and a circumferential surface lying parallel to said first shaft and comprising a spur gear;

(d) a second presser roll rotatably mounted on said second shaft and having a circumferential surface serving as a second presser surface parallel to said second shaft and confronting said first presser surface, and an end surface parallel to said first shaft and having a pin gear facing said first shaft and held in mesh with said spur gear;

(e) said first and second presser surfaces having closest confronting portions for positioning the coupling elements therebetween, said closest confronting portions being spaced from each other by a first distance equal to the thickness of each of the coupling elements between outer surfaces of legs thereof; and

(f) one of said first and second rolls being positionally adjustable on said base to vary said first distance.

4,599,066

RADIANT ENERGY BURNER

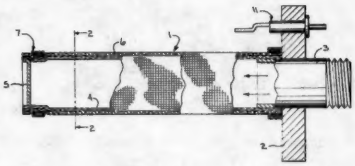
Dirk N. Granberg, Brookfield, Wis., assignor to A. O. Smith Corp., Milwaukee, Wis.

Continuation of Ser. No. 580,686, Feb. 16, 1984, abandoned.

This application Oct. 25, 1985, Ser. No. 792,165

Int. Cl.[4] F23D *14/14*

U.S. Cl. 431—329 **5 Claims**



1. In a radiant energy burner, a combustion element comprising a porous metal support having an inner surface and an outer surface, a woven fabric disposed on the outer surface of said support and composed of substantially continuous ceramic fibers, connecting means for securing end portions of said fabric to said support, said connecting means being metal and being enclosed in a ring-like sleeve of woven ceramic fiber, the central portion of said fabric being free of attachment to said support, supply means including a blower to supply a gaseous fuel through said support and said fabric, and fuel igniting means disposed adjacent to the outer surface of the fabric to ignite said fuel.

4,599,067

APPARATUS FOR THE THERMAL REMOVAL OF LACQUER FROM METALLIC AND CERAMIC ARTICLES

Ewald Schwing, Wiesfurthstr. 99, 4133 Neukirchen-Vluyn; Peter Sommer, Johann-Strauss-Str. 13, 4174 Issum 2, and Horst Uhrner, Schumannstr. 9, 4174 Issum, all of Fed. Rep. of Germany

Filed Sep. 28, 1984, Ser. No. 655,887

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1983, 3335539

The portion of the term of this patent subsequent to Apr. 22, 2003, has been disclaimed.

Int. Cl.[4] F27B *15/00*

U.S. Cl. 432—58 **5 Claims**

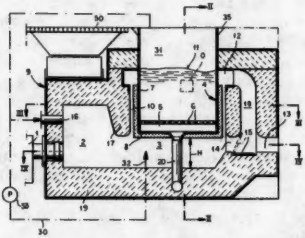
1. An apparatus for delacquering metallic and ceramic objects, comprising:

a unitary housing formed with a burner chamber provided with at least one burner, and an afterburner chamber connected with said burner chamber;

a fluidized-bed retort in said housing having a bottom formed with a nozzle chamber communicating with the interior of said retort through nozzles for delivering a

fluidizing gas to a fluidized bed in said retort into which said objects can be introduced for delacquering, the delacquering producing a retort gas containing combustibles;

means for feeding at least a portion of said retort gas from said retort to said afterburner chamber for combustion thereof to produce heat surges, said retort being heated from below by heat from said burner chamber and said afterburner chamber, said chambers and said retort being provided in a common housing, with the bottom of said



retort being disposed above said afterburner chamber, and said housing defining with a wall of said retort adjacent said bottom, an annular gap traversed by combustion gases from said afterburner chamber; and

an exhaust gas outlet connected with said gap and means in said housing forming a bypass between said afterburner chamber and said outlet, said bypass being provided with a valve for selectively controlling the passage of gas through said bypass and through said gap.

4,599,068

APPARATUS FOR PREHEATING GRANULAR ORE

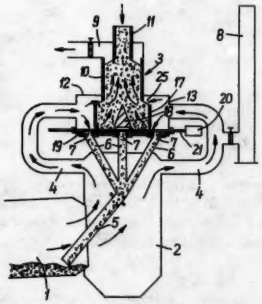
Wilhelm Janssen, Mülheim, and Klaus Ulrich, Heiligenhaus, both of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit berschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Dec. 27, 1984, Ser. No. 686,881

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1983, 3347272

Int. Cl.⁴ F27D *1/08;* **F26B** *17/12;* **C21B** *7/00;* **F27B** *7/02*

U.S. Cl. 432—97 **11 Claims**



1. In an apparatus for preheating granular ore, including means defining a shaft, means defining an inlet chute disposed above the shaft for introducing the ore thereinto by gravity, means defining an ore discharge collector situated underneath the shaft for receiving ore therefrom, the improvement wherein said means defining said shaft includes parallel, vertical first and second end walls adjoined by parallel, vertical first and second side walls; said shaft having essentially a rectangular horizontal cross-sectional shape; further wherein said means defining said discharge collector includes parallel, vertical third and fourth end walls adjoined by parallel, vertical third and fourth side walls; said discharge collector having essentially a rectangular horizontal cross-sectional shape; said first and second end walls of said shaft being situated above and in a coplanar relationship with said third and fourth end walls, respectively, of said discharge collector; the improvement further comprising an insert body situated in said discharge collector and extending generally horizontally therecross, said insert body having a downwardly widening configuration; discharge means disposed at a lower end of said discharge collector for removing the preheated ore therefrom; and gas guiding means for introducing a first part of heating gases into said discharge collector in an upwardly-directed flow therethrough and for introducing a second part of heating gases directly into said shaft in an upwardly-directed flow therethrough; said gas guiding means for introducing said second part including gas passages defined between said shaft and said discharge collector; said gas guiding means being arranged such that said second part of said heating gases is substantially greater than said first part of said heating gases.

4,599,069

SUBSTRATE HOLDER FOR MOLECULAR BEAM EPITAXY APPARATUS

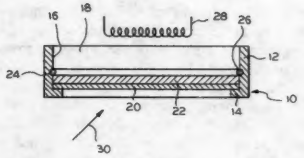
Shunichi Murakami; Tetsuo Ishida, and Junro Sakai, all of Tokyo, Japan, assignors to Anelva Corporation, Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,009

Claims priority, application Japan, Feb. 27, 1984, 59-35829

Int. Cl.⁴ F27D *5/00;* **C23C** *14/00;* **F24H** *3/00;* **H01J** *37/305*

U.S. Cl. 432—253 **17 Claims**



1. A holder for holding a semiconductor substrate to place said substrate in a molecular beam epitaxy apparatus, said epitaxy apparatus including heating means for heating said substrate, said substrate having a first surface for epitaxial growth, a second surface opposite to the first surface and directed towards said heating means, and a side surface contiguous to both of the first and second surfaces, said holder comprising:

a supporting member having an inside surface defining a space for receiving said substrate and a flange portion radially projecting inwardly from said inside surface to cover a peripheral portion of said space and to engage a circumferential portion of the first surface of said substrate, said flange portion thereby maintaining said substrate within said space.

4,599,070

AIRCRAFT SIMULATOR AND SIMULATED CONTROL SYSTEM THEREFOR

Walter Hladky, Chatham; Ralph J. DeVito, Kendall Park, and Louis S. Hoffman, Morristown, all of N.J., assignors to Control Interface Company Limited, Randolph, N.J.

Filed Jul. 29, 1981, Ser. No. 288,131

Int. Cl.⁴ G09B *9/08*

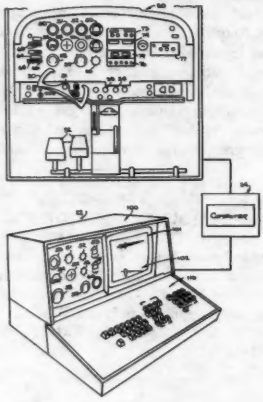
U.S. Cl. 434—45 **15 Claims**

1. Apparatus for simulating a moveable control for a system in which force and movement parameters of the control can be varied in accordance with simulated operation of the system, comprising:

a movable control element;

a lever apparatus including a lever having first and second ends, means for pivoting the lever at a fulcrum point adjustably positioned between the first and second ends, and means coupled to the second end of the lever for applying a centering force to the lever to resist pivoting of the lever from a neutral position, the centering force being a predetermined function of displacement of the lever from the neutral position;

means for coupling the first end of the lever to the control element for moving the first end of the lever to pivot the lever in response to movement of the control element; and



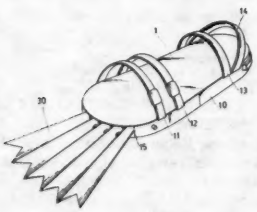
means adapted to be coupled to a control means which is responsive to conditions to be simulated during operation of the system for positioning the pivoting means to any one of a plurality of adjustable points between the first and second ends of the lever to change the fulcrum point of the lever and thereby the mechanical advantage of the first end of the lever with respect to the second end of the lever such that the force required at the first end of the lever for a given displacement of the first end of the lever against the centering force at the second end of the lever can be varied, whereby the force required to move the control element over a given distance can be varied to simulate the feel of operating the system.

4,599,071

ADJUSTABLE BEACH-SHOES

Ruey T. Juang, No. 26, Pi-Feng Rd., Tsaotun, Nantu Hsien, Taiwan

Filed Nov. 19, 1984, Ser. No. 673,035
Int. Cl.[4] A63C *31/10*
U.S. Cl. 441—64 **2 Claims**



1. An adjustable beach-shoe, comprising:

a platform with four straps adjustable in length secured thereon, including a peripheral wall projecting downwards with a recess defined thereby, having a front end and a rear end provided with a first cut-out and a second cut-out with similar shapes respectively, and two sides of said peripheral wall being provided with inward guiding grooves, a spring member mounted in said recess at the end thereof near the rear end of the platform, the spring member providing a biasing force in a direction toward said front end, and a plurality of projections provided with respect to said front end;

a web member including a tubular portion having two ends, a pair of spring-loaded pins mounted on said two ends respectively, a metal plate secured longitudinally to the tubular portion and having an upper surface and a lower surface, a pair of packing pieces attached to said upper surface and said lower surface of said metal plate respectively, a plurality of elastic threads secured to said tubular portion and extended in a direction opposite to said metal plate, a plastic membrane extended over a surface including said elastic threads, said web member being movable forwards and backwards within said recess with the sliding of said spring-loaded pins along said inside guiding grooves when said web member is mounted in said recess;

a sole member mounted on said platform to cover said recess; and

a guard piece contoured complementarily with each of said first and second cut-outs and provided with slits for engaging with said projections of said platform, the guard piece for the first cut-out being adapted to fit in said first cut-out when said web member is entirely received in said recess to provide a beach-shoe.

4,599,072

EQUIPMENT FOR MOVEMENT ON WATER SURFACE AND TOWLESS AQUATIC SKI

Piero Pollini, San Maurizio d'Opaglio; Giovanni M. Bertelé, Via Roma-Condominio 5 Colli, 22040 Lurago d'Erba, Como, and Ettore Comoli, Sostegno, all of Italy, assignors to Giovanni Marco Bertelé and Alessandro Salice, both of, Italy

Filed Mar. 14, 1984, Ser. No. 589,357
Claims priority, application Italy, Mar. 14, 1983, 84603 A/83; Sep. 1, 1983, 22732 A/83
Int. Cl.[4] A63C *15/00*
U.S. Cl. 441—65 **19 Claims**

1. A water ski, comprising

an elongated body, said elongated body composed of a plurality of floating sections, a front section and a rear section,

means for receiving a foot, said foot receiving means associated with said front section of said elongated body,

an articulated joint interconnecting said front and rear sections of said elongated body, said articulated joint being pivoted about a mean vertical longitudinal plane of said elongated body, and

means for resiliently longitudinally aligning said front and rear sections with respect to one another, wherein said articulated joint comprises

a substantially U-shaped recess, in one of said front and rear sections,

a lug extending from the other of said front and rear sections and adapted to fit into said U-shaped recess,

a hole extending through said lug, and a pair of holes extending through the one of said front and rear sections, such that all three holes are aligned when said lug is fitted into said U-shaped recess,

a pin adapted to fit through all three holes when the same are aligned, and

wherein said aligning means comprise

a groove disposed on an outer surface of said lug extending in a direction substantially parallel to the mean vertical longitudinal plane,

a seat formed along an edge of said U-shaped recess, and

a sphere adapted to be partially accomodated in said seat and in said groove.

4,599,073

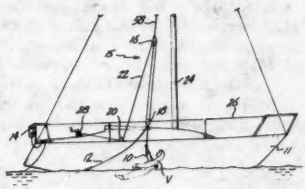
MAN OVERBOARD RESCUE SYSTEM

Douglas M. Fryer, Seattle; Frederick W. Hayes, Bellevue, and Richard S. Marshall, Medina, all of Wash., assignors to The Sailing Foundation, Seattle, Wash.

Continuation-in-part of Ser. No. 631,230, Jul. 16, 1984, abandoned. This application Feb. 14, 1985, Ser. No. 701,544

Int. Cl.[4] B63C *9/00, 9/08*

U.S. Cl. 441—80 4 Claims



1. A flotation/hoisting sling used for rescuing a person who has fallen overboard from a boat, comprising:

(a) a fabric-covered central grasp section about eighteen inches long containing a quantity of buoyant foam flotation material, said central grasp section being relatively pliable and having a first end and a second end;

(b) a first fabric-covered buoyancy section about the same length as said central grasp section and containing a quantity of buoyant foam flotation material and a second fabric-covered buoyancy section about the same length as said central grasp section and containing a quantity of buoyant foam flotation material, said first and second buoyancy sections extending longitudinally and being relatively non-pliable, said first buoyancy section being connected to the first end of said central grasp section and said second buoyancy section being connected to the second end of said central grasp section;

(c) a main support strap at least about seventy inches long having a first end and a second end, said main support strap extending through said first buoyancy section, said central grasp section, and said second buoyancy section;

(d) a first resilient D-ring and a second resilient D-ring, said first D-ring being connected to said first end of said main support strap and said second D-ring being connected to said second end of said main support strap; and

(e) said flotation/hoisting sling having sufficient strength to support the weight of an adult person being hoisted out of the water in said flotation/hoisting sling and containing a sufficient quantity of said buoyant foam flotation material to provide about twenty pounds of flotation as required by U.S. Coast Guard specifications for Type IV personal flotation devices.

4,599,074

MAN OVERBOARD RETRIEVAL DEVICE

David E. Beckly, Knighton, Buckland Monachorum, Nr. Yelverton, S. Devon, England (PL20 7LH)

Filed Nov. 14, 1984, Ser. No. 671,205

Claims priority, application United Kingdom, Nov. 15, 1983, 8330380

Int. Cl.[4] B63B *21/04*

U.S. Cl. 441—80 11 Claims

1. A man-overboard retrieval device for retrieving a man who has fallen overboard from a vessel into the water comprising:

a rigid boom having an inboard end and an outboard end;

a strap connected at one end to said outboard end of said boom and having a generally flat cross-section with longitudinally extending beads of enlarged thickness along each edge;

a draw-cord attached to the other end of said strap and extending along said boom to said inboard end, said strap forming, by virtue of its cross-sectional shape, a semi-rigid, flexible, self-supporting bight at said outboard end which can be placed around said man to be retrieved and which can be tightened from said inboard end by means of said draw-cord; and

attachment means on said boom for adapted connection to hoist means on said vessel for hoisting said man out of the water.

4,599,075

SURVIVAL SUIT

Holger B. Nygard, Nappa Lofoten, N-8382, Norway

Filed Oct. 17, 1984, Ser. No. 661,660

Claims priority, application Norway, Feb. 18, 1983, 830568

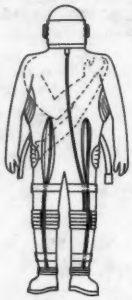
Int. Cl.[4] B63C *9/08*

U.S. Cl. 441—103 9 Claims

5. A survival suit for use by a wearer immersed in water, the survival suit comprising

a garment for enclosing the body of the wearer to protect the wearer from the environment outside of the suit, the garment including an outer skin, an inner skin, an insulation layer therebetween, and expansion means for selectively altering the shape of the garment to provide either a clothes-like shape defining a set of clothes having sleeves and legs for closely fitting appendages of the wearer's body to permit the wearer to move and swim while wearing the suit or a sack-like shape defining a flexible sack surrounding the body of the wearer to permit the wearer

to move his arms and legs freely within the confines of the sack while curled into a fetal position or the like and to rub



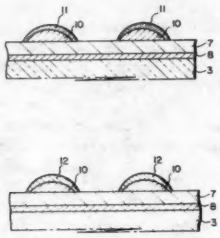
the parts of his body which suffer from exposure to cold temperature.

4,599,076

METHOD OF PRODUCING DISCHARGE DISPLAY DEVICE

Shigeru Yokono; Masatoshi Takahashi, and Hideo Sato, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 11, 1985, Ser. No. 721,955
Claims priority, application Japan, Apr. 19, 1984, 59-79216
Int. Cl.[4] H01J *9/12*
U.S. Cl. 445—24 **3 Claims**



1. A method of producing a discharge display device comprising the steps of applying a paste prepared by mixing LaB_6 powder with alkali glass powder in a proportion of 20–40 wt. % of glass powder with respect to the LaB_6 powder, to a base electrode, burning the paste, and activating the paste by gas discharge with large current following an exhaustion step to form a LaB_6 cathode on said base electrode.

4,599,077

MODULAR TOY

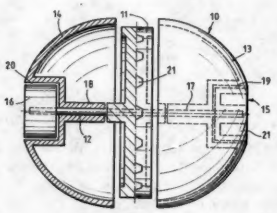
Michel Vuillard, 93, rue du General de Gaulle, F-67640 Fegersheim, France, assignor to Michel Vuillard and Frederic Rubach, both of, France

Filed Jul. 11, 1984, Ser. No. 629,712
Claims priority, application France, Jul. 18, 1983, 83 11936
Int. Cl.[4] A63H *33/04, 17/00, 33/08*
U.S. Cl. 446—85 **6 Claims**

1. A modular toy having at least one composite base module comprising

(a) a central circular plate **(11)**, disposed normal to its central axis, supported on a fixed axle **(12)** which is coaxial with said central axis, integral with said central circular plate and extending axially on either side of said plate, said central circular plate **(11)** being provided with a pair of rotatable end elements **(13, 14)** respectively mounted on either side of said central circular plate for free rotation on said fixed axle, each rotatable end element having a central recess area wherein said fixed axle projects thereinto, the diameter of said central circular plate being smaller than the diameter of said rotatable elements;

(b) a plurality of openings **(21)** regularly disposed on the periphery of said central circular plate **(11)** and arranged for selective attachment of accessories to said central circular plate, so that said composite base module can provide different toys by selectively attaching different



accessories to sid openings **(21)** of said central circular plate **(11)**, wherein said base module may be displaced by rolling on said rotatable end elements **(13, 14)**; and

(c) retaining tips **(15, 16)** being fixed at the extremities of sid fixed axle **(12)**, encompassed by said central recess areas and arranged so that said tips maintain said rotatable end elements **(13, 14)** in position for free rotation on said fixed axle **(12)**, wherein said retaining tips further provide openings **(21)** for connecting accessories to said base module; and said rotatable end elements consist of semi-spherical elements **(13, 14)** mounted on either side of said central circular plate **(11)**.

4,599,078

TRANSFORMABLE TOY ASSEMBLY

Hiroyuki Obara, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

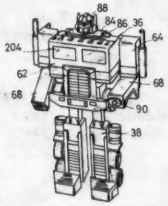
Filed Jan. 18, 1985, Ser. No. 692,829
Claims priority, application Japan, May 30, 1984, 59-110531
Int. Cl.[4] A63H *17/00*
U.S. Cl. 446—95 **11 Claims**

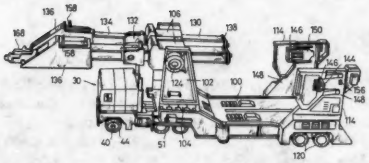
1. A transformable toy assembly having at least two assembly elements that are separable and combinable with each other, each being independently reversibly and transformable between different positions to provde different forms of a toy, comprising:

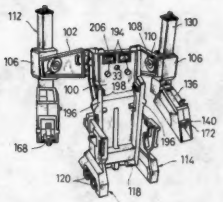
a first assembly element having component parts adapted to be reversibly transformable between a tractor truck form and a robotic humanoid form; and

a second assembly element having component parts adapted to be reversibly transformable among a trailer truck form, a launcher form, a base form and a dock form, whereby combining the first and second assembly elements provides a semitrailer truck form when the first element takes the form of said tractor and said second element takes the form of said trailer, an armed vehicle form when said first element takes the form of said tractor and said second

element takes the form of said launcher, and a large-sized robotic humanoid form when said first assembly element







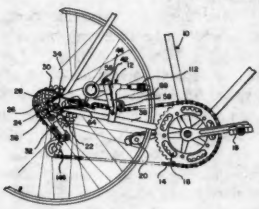
takes the form of said robotic humanoid and said second assembly element takes the form of said dock.

4,599,079

AUTOMATIC DERAILLEUR SHIFTER

Gilmore H. Chappell, 218 S. Melville Street, Philadelphia, Pa. 19139

Filed Mar. 4, 1985, Ser. No. 707,960
Int. Cl.[4] F16H *9/00*
U.S. Cl. 474—80 **20 Claims**



1. An automatic shifter for a derailleur attached to the frame of a bicycle of the type having large drive gear, an endless drive chain, a rear axle and a cluster of driven gears comprising

pivot means secured to the frame in spaced relation shift to the derailleur;

shifter arm means pivotally secured to the pivot means to move relative to the frame;

a follower means attached to the shifter arm means, the follower means being in contact with the endless chain to rotatively move the shifter arm means in response to changes in tension in the chain;

spring means interconnected between the pivot means and the shifter arm means to continuously bias the follower means into contact with the chain;

stabilizing means interconnected between the pivot means and the shifter arm means to retard the bias of the spring means; and

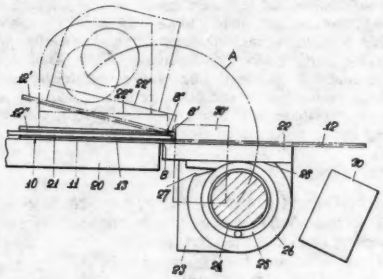
cable means interconnecting a portion of the shifter arm means and the derailleur to move the derailleur to index the chain across the cluster of driven gears in response to movement of the shifter arm means.

4,599,080

METHOD FOR FOLDING JACKET MATERIAL FOR DISK OR THE LIKE

Akira Tada, Toyonaka, and Koichi Tanigawa, Kawanishi, both of Japan, assignors to O-M Limited, Osaka, Japan

Division of Ser. No. 552,242, Nov. 16, 1983, Pat. No. 4,559,030.
This application Jan. 24, 1985, Ser. No. 694,636
Claims priority, application Japan, Nov. 19, 1982, 57-204347
Int. Cl.[4] B31B *1/28*
U.S. Cl. 493—267 **2 Claims**



1. A method of folding a flat plastic jacket material for forming an envelope for a magnetic disk or the like, the jacket material having a first side and a second side joined along a portion to be folded, said method comprising:

placing a first side of the jacket material on a folding table with said portion and the other side extending beyond the edge of the table;

placing a folding insert onto said first side with the forward end of the folding insert projecting past said edge of the table and pressing said one side against the table;

moving a folding bar upwardly from below the surface of the table against the projecting portion of the folding insert with the jacket material between the folding bar the folding insert and directly contacted by the folding bar;

moving the folding bar outwardly along the projecting portion of the folding insert while rubbing the jacket material against the folding insert and then moving the folding bar upwardly and back over the folding insert through an arc of substantially 180° to fold said portion of the jacket material around the end of the folding insert and fold the second side of the jacket material back against the top of the folding insert while continuing to rub the jacket material against the folding insert in tight contact therewith; and

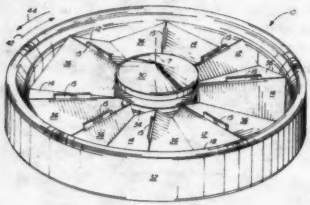
applying a heater bar directly against said portion of the jacket material where it extends over the end of the folding insert for shaping the end of the folding insert.

4,599,081

ARTIFICIAL HEART VALVE

Fred M. Cohen, 2601 E. Vogel Ave., Phoenix, Ariz. 85028

Filed Sep. 30, 1982, Ser. No. 430,403
Int. Cl.[4] A61F 2/24, 2/22
U.S. Cl. 623—2 31 Claims



24. A valve for at least one of a human and an artificial heart, comprising:

means for providing an occludable space about a central axis; and

an axially rotatable occluder means for substantially occluding and unoccluding said space in response to respective backward and forward differential blood pressures across said occluder means; and

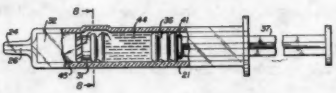
said occluder means being moveable with respect to said space-providing means, said occluder means being substantially symmetrical with respect to said space-providing means at least along said axis, the angular rotation of said occluder means with respect to said space-providing means being relatively independent of the magnitude of the blood flow rate through the occludable space but being controlled by said occluder means to insure equal and opposite angular rotation thereof in both occluding and unoccluding directions.

4,599,082

TWO-COMPONENT SYRINGE ASSEMBLY

Jean P. Grimard, Vif, France, assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Aug. 13, 1984, Ser. No. 640,434
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—90 26 Claims



1. A two-component mixing syringe comprising:

an elongate, hollow barrel having a chamber for retaining the components;

a tip extending from a distal end of said barrel having a passageway therethrough communicating with said chamber;

a by-pass stopper slidably positioned in fluid-tight engagement inside said barrel having a distal rib contacting said barrel, said stopper having a recess on the proximal side of said rib and a groove in said rib, said groove allowing fluid communication between said recess and said chamber and positioned angularly with respect to the longitudinal axis of said barrel so that fluid passing through said groove is directed angularly with respect to the longitudinal axis of said barrel;

a raised peripheral portion of said barrel serving as a by-pass and defining a by-pass zone, said by-pass zone being shorter than the length of said by-pass stopper along the longitudinal axis of said barrel, said by-pass being sufficiently long and raised to allow fluid to flow around said stopper between the proximal end of said stopper and said recess when the proximal end of said stopper is positioned in said by-pass zone; and

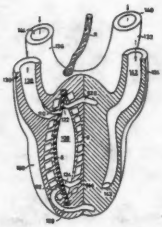
a piston slidably positioned in fluid-tight engagement inside said barrel adapted to engage a plunger rod to facilitate its operation, said piston capable of moving fluid from said chamber through said passageway upon its movement toward said distal end, said piston capable of facilitating the drawing of fluid into said chamber through said passageway upon its movement away from said distal end.

4,599,083

METHOD AND DEVICE FOR FLUID TRANSFER

Gena Perlov, 18 Disraeli Street, Haifa, and Samuel Tuchman, 15 Hanarkissim Street, Kiryat Bialik, both of Israel

Division of Ser. No. 256,522, Apr. 21, 1981, Pat. No. 4,498,850.
This application Oct. 11, 1984, Ser. No. 659,665
Claims priority, application Israel, Apr. 28, 1980, 59942
Int. Cl.[4] A61F 2/22
U.S. Cl. 623—3 4 Claims



1. An artificial implantable heart, comprising:

a housing-like body defining and delimiting at least one cavity;

at least one, elastically flexible magnetically activatable diaphragm consisting of a substantially flat discoid element having an elastomer base to which is admixed a permanent magnetic substance, said diaphragm being capable of forming in conjunction with said cavity one or more pocket-like chambers;

at least one inlet and one outlet aperture connectable to blood-delivering and blood receiving blood vessels respectively;

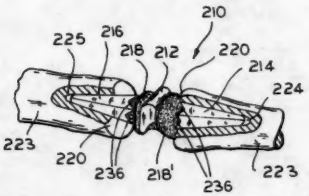
a plurality of electromagnetic means arranged in proximity to said cavity and adapted when current is applied to generate, in a predeterminable sequence, a plurality of magnetic fields of controllably changing polarities and intensities producing by combination of forces of attraction and repulsion, cycles of dynamic deflections of said diaphragm, whereby said pocket-like chambers are peristaltically manipulated to the effect of causing the volume of at least one of said pocket-like chambers to be progressively diminished and simultaneously the volume of said at least one other pocket-like chamber to be progressively increased, whereby blood is expelled from said at least one diminishing-volume chamber into said blood-receiving blood vessels, while blood is drawn into said at least one increasing-volume chamber from said blood-delivering blood vessels.

4,599,084

METHOD OF USING BIOLOGICAL TISSUE TO PROMOTE EVEN BONE GROWTH

Aws S. Nashef, Costa Mesa, Calif., assignor to American Hospital Supply Corp., Evanston, Ill.

Filed May 24, 1983, Ser. No. 497,624
Int. Cl.[4] A61F 2/28
U.S. Cl. 623—16 1 Claim



1. A method of interfacing a surgically implanted prosthetic or biological implant from contact with the surface of resected bone comprising interposing a barrier layer of glutaraldehyde-fixed pericardial tissue at the interface of said resected bone and said implant, such that the fibrous surface of the fixed pericardial tissue is disposed in direct contact with the resected bone to allow for bone tissue ingrowth into said fibrous surface; said tissue being further treated such that it is substantially resistant to calcification; and said layer of pericardial tissue having overall dimensions sufficient to cover at least a portion of the outer surface of said implant and a portion of said resected bone.

4,599,085

BONE IMPLANT MEMBER FOR PROSTHESES AND BONE CONNECTING ELEMENTS AND PROCESS FOR THE PRODUCTION THEREOF

Guido Riess, and Albert Geiger, both of Garmisch-Partenkirchen, Fed. Rep. of Germany, assignors to Neodontics, Inc., Laguna Niguel, Calif.

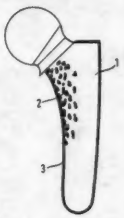
Continuation of Ser. No. 492,155, May 10, 1983, abandoned, which is a continuation of Ser. No. 168,059, Jul. 11, 1980, abandoned. This application Feb. 1, 1984, Ser. No. 575,696
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1979, 2928007
Int. Cl.[4] A61F 2/28, 2/30, 2/36
U.S. Cl. 623—16 5 Claims

1. A bone implant member capable of being used for bones, joints, dental prosthesis, bone screws and splints, and other bone connecting elements, said bone implant member being fashioned at least in part of a compound consisting essentially of a substantially homogeneous sintered mixture of:

(a) a bioreactive, particulate calcium phosphate ceramic, said ceramic consisting essentially of a mixture of tricalcium phosphate and tetracalcium phosphate; and

(b) a biocompatible, mechanically stable, particulate metal;

wherein the bone implant member is formed by admixing the particulate calcium phosphate ceramic and the particulate metal and bonding the particulate calcium phosphate ceramic



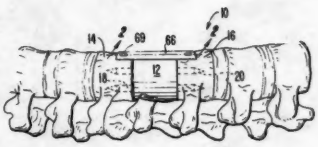
and the particulate metal by sintering under high pressure whereby the particulate metal is substantially homogenously distributed throughout the sintered bone implant member.

4,599,086

SPINE STABILIZATION DEVICE AND METHOD

James R. Doty, 614 Concerto La., Silver Spring, Md. 20901

Filed Jun. 7, 1985, Ser. No. 742,410
Int. Cl.[4] A61F 2/44
U.S. Cl. 623—17 49 Claims



1. A spine stabilization device comprising:

a vertebral body prosthesis adapted to be positioned between first and second separated vertebral bodies,

said prosthesis having a prosthesis first end and an opposite prosthesis second end,

a first anchoring pin extendible relative to said prosthesis and out of said prosthesis first end,

a second anchoring pin extendible relative to said prosthesis and out of said prosthesis second end, and

a rack gear means for extending said first anchoring pin out of said prosthesis first end and driving it into said first vertebral body to secure said prosthesis to said first vertebral body, when said prosthesis is positioned between said first and second vertebral bodies, and for extending said second anchoring pin out of said prosthesis second end towards said second vertebral body.

4,599,087

TREATMENT OF TEXTILE MATERIALS TO IMPROVE THE FASTNESS OF DYEINGS MADE THEREON

Jürg Heller, Oberwil; Bruno Kissling, Hagendorf; Tibor Robinson, Basel, and Salvatore Valenti, Binningen, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Dec. 24, 1984, Ser. No. 686,136

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1984, 3400054; Mar. 9, 1984, 3408638; Jul. 21, 1984, 3426925; Jul. 21, 1984, 3426926

Int. Cl.[4] C08G *73/02*; D06L *3/12*; D06P *1/52*

U.S. Cl. 8—495 22 Claims

1. A process for dyeing, printing or optically brightening a textile substrate comprising fibers containing nitrogen or hydroxy groups, which process comprises applying to said substrate a compound (A) or (A1) and applying subsequently thereto an anionic or basic dyestuff or optical brightener, said compound (A) being a polymeric compound obtained by the reaction of an epihalohydrin or precursur thereof with a polyalkylene polyamine (B) and said compound (A1) being a polymeric compound obtained by the reaction of a compound (A) with a N-methylol compound in the presence of a catalyst.

4,599,088

CLEAR STABLE GASOLINE-ALCOHOL-WATER MOTOR FUEL COMPOSITION

Marshall E. Davis, Poughkeepsie, and Rodney L. Sung, Fishkill, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 30, 1984, Ser. No. 645,642

Int. Cl.[4] C10L *1/32*

U.S. Cl. 44—51 17 Claims

1. A clear stable motor fuel composition of the "water-in-petroleum" type microemulsion in which the average particle diameter of the dispersed phase is about 0.1 micron or smaller, said motor fuel composition comprising a mixture based on the final motor fuel composition of about 2.0 to 10.0 volume percent of an alcohol selected from the group consisting of methanol, ethanol, tertiary butyl alcohol, isopropanol, and mixtures thereof; about 0.10 to 0.50 weight percent water; about 0.10 to 3.0 weight percent of a nonionic adduct of alkylphenol and ethylene oxide surfactant having the structural Formula I, as follows:

$$R(CH_2CH_2O)_xH \qquad I$$

wherein: R is an alkylphenol group where the alkyl group has 9–24 carbon atoms; and x is an integer from 6–10.0; and the balance of said clear stable motor fuel composition comprises gasoline.

4,599,089

COAL-WATER DISPERSION

Lars L. Stigsson, and Björn Lindman, both of Lund, Sweden, assignors to Fluidcarbon International AB, Malmö, Sweden

Continuation-in-part of Ser. No. 480,959, Mar. 29, 1983, abandoned. This application Feb. 22, 1985, Ser. No. 704,586

Int. Cl.[4] C10L *1/32*

U.S. Cl. 44—51 24 Claims

1. A dispersion comprising water, pulverized coal and stabilizing additives, the coal content ranging from 60 to 80% by weight and the additives comprising a combination of (a) sufficient lecithin adsorbed on surfaces of coal particles to provide repulsion between the coal particles by hydration forces and (b) polymer cooperating with said lecithin and comprising at least one polymer having segments of hydrophobic as well as segments of hydrophilic character.

3. A dispersion as claimed in claim 1, wherein said segments of hydrophobic character are selected from the group consisting of those of polypropylene oxide, of alkyl groups, of alkylaryl groups and of combinations thereof, and wherein said segments of hydrophilic character are those of polyethylene oxide with at least 20 ethylene oxide units.

4,599,090

METHOD FOR PREPARING NITROGEN- AND OXYGEN-CONTAINING COMPOSITIONS USEFUL AS LUBRICANT AND FUEL ADDITIVES

Thomas F. Steckel, Chagrin Falls, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 244,946, Mar. 18, 1981, Pat. No. 4,477,362. This application May 25, 1984, Ser. No. 614,341

Int. Cl.[4] C10L *1/22*

U.S. Cl. 44—63 43 Claims

1. A method for preparing nitrogen- and oxygen-containing compositions which comprises reacting, in the presence of an acidic catalyst,

(A) at least one aliphatic hydroxy compound of the formula $R^1(OH)_x$ wherein R^1 is an aliphatic hydrocarbon-based radical and x is an integer which is at least 1, with

(B) at least one (tertiary amino) alkanol; wherein the ratio of equivalents of reagents (A):(B) is in the range of about 1:100 up to about 100:1; wherein the amount of catalyst is in the range of about 0.01 up to about 20 based on the weight of the reaction mixture of (A) and (B); and wherein the reaction is conducted at a temperature from about 140° C. up to just below the decompostion temperture of any component of the reaction mixture.

4,599,091

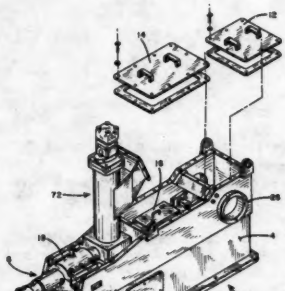
BRIQUETTE FORMING APPARATUS

Andrew O. Lee, 7126 Newton Ave., Richfield, Minn. 55423; Heinz A. Muehlbauer, 2920 Kibler Ave., and Keith Blackburn, 1316 Florence St., both of Enumclaw, Wash. 98022

Filed Sep. 14, 1984, Ser. No. 650,431

Int. Cl.[4] B30B *11/00*

U.S. Cl. 44—11 12 Claims



1. Briquette forming apparatus comprising:

an enclosed housing having a sump portion containing a lubricant and at least one overlying multi-segmented ram slide portion having a lengthwise bore;

an elongated ram slidably mounted within the bore of said ram slide portion for reciprocating movement therein;

means coupled to said ram for providing reciprocating motive power thereto;

means for controllably supplying combustible raw materials to a compaction chamber displaced along the bore of said ram slide portion;

die means receiving said raw materials from said compaction chamber and having a tapered bore of larger diameter at the end adjacent to said compaction chamber than at an output end for compressively extruding said raw material into a predetermined shape, upon exiting said output end, in response to the reciprocating movement of said ram; and

a plurality of detachable housing covers overlying said ram

slide portion and forming a part of said lenthwise bore and said compaction chamber, each of said housing covers being individually detachable from said ram slide portion for permitting access to regions subject to wear located along said ram slide portion, thereby facilitating the maintenance of said apparatus.

2. Apparatus as set forth in claim 1, including first and second sleeve bearings mounted beneath a first of said plurality of housing covers in concentric relation to said ram, each of said sleeve bearings having a lengthwise bore including a spiral groove for directing lubricant from a region between said first and second sleeve bearings to the opposite ends of said first and second sleeve bearings, thereby lubricating and cooling said ram during its reciprocatory motion.

4,599,092

PROCESS FOR THE GASIFICATION OF CARBONACEOUS AGGLOMERATES IN A FIXED BED REACTOR

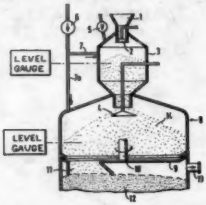
Michael Eichelsbacher, Mainz; Rudolph Kohlen, Wehrheim; Rainer Reimert, Idstein; Carl Hafke, Frankfurt, and Wolfgang Schäfer, Bottrop, all of Fed. Rep. of Germany, assignors to Ruhrgas Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Dec. 9, 1983, Ser. No. 559,725

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1982, 3245567

Int. Cl.[4] C10J *3/02, 3/30*

U.S. Cl. 48—197 R 9 Claims



1. In a process for the gasification of carbonaceous fuel in a pressurized reactor having a fuel distributor with a bed of fuel, and a pressure lock above the reactor with inlet and outlet valves, said process comprising the steps of:

providing a fixed bed of fuel in said reactor;

in a first portion of a complete cycle, passing the fuel through the inlet valve into the pressure lock with the outlet valve between the pressure lock and the fuel distributor being closed;

periodically feeding said fuel in the form of fuel agglomerates from the pressure lock through the open outlet valve into the fuel distributor disposed in said reactor above said fixed bed, while maintaining the inlet valve closed during another portion of the cycle and with said fuel distributor distributing said agglomerates onto said fixed bed;

continuously causing gasification agents to flow upwardly through said fixed bed to gasify the agglomerates and produce a product gas having a high content of steam throughout the complete cycle;

continuously tapping, through a tap, the product gas having a high content of steam from the reactor above said fixed bed and below said fuel distributor throughout the complete cycle;

intermittently introducing a controlled atmosphere substantially free of steam and oxygen into said pressure lock; and wherein the improvement includes,

continuously introducing a controlled atmosphere directly into the fuel distributor without passing through the pressure lock during gasification of the agglomerates throughout the complete cycle sufficiently for maintaining substantially only said controlled atmosphere in said fuel distributor at a pressure sufficient to produce a pressure gradient from the lock across the bed of the fuel distributor to the fixed bed of the reactor to prevent substantial contact between said steam containing product gas and said agglomerates in said fuel distributor and sufficiently for flowing the controlled atmosphere from the fuel distributor to the tap.

4,599,093

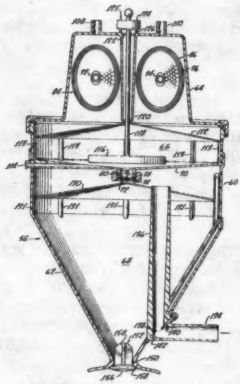
EXTRACORPOREAL BLOOD PROCESSING SYSTEM

Robert F. Steg, Jr., 892 Brighton Lake Rd., Brighton, Mich. 84116

Division of Ser. No. 348,338, Feb. 12, 1982, Pat. No. 4,490,331. This application Aug. 2, 1984, Ser. No. 636,998

Int. Cl.[4] B01D *53/22;* A61M *1/03*

U.S. Cl. 55—16 28 Claims



1. The method of both oxygenating and changing temperature of blood in an extracorporeal blood processing system comprising the steps of

positioning at least one membrane within a closed vessel to form a gas path and a plurality of blood flow paths adjacent said gas path,

flowing venous blood through said blood flow paths,

flowing gaseous oxygen through said gas path to enable exchange of gases across said membrane, and

controlling the temperature and flow velocity of said oxygen, said step of controlling comprising

changing the temperature of said oxygen to a value different than that of venous blood flowing into said blood flow paths, and

maintaining the flow velocity of said oxygen at a value of not less than five meters per second.

4,599,094

ENHANCED PRESSURE SWING ADSORPTION PROCESSING

Robert G. Werner, Danbury, Conn., and Homer Fay, Snyder, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 7, 1985, Ser. No. 709,171

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—26 50 Claims

1. An adiabatic pressure swing adsorption process for the selective adsorption of nitrogen from air, and the recovery of high purity nitrogen product, in an adsorption system having at least two adsorbent beds, each of which undergoes, on a cyclic basis, a processing sequence comprising:

(a) introducing coproduct effluent gas withdrawn from the

discharge end of another bed in the system to the discharge end of said bed, before and/or simultaneously with the passage of feed to the feed end of the bed, thereby increasing the pressure of the bed from a subatmospheric desorption pressure to an intermediate pressure level;

(b) passing feed air to the feed end of said bed, with or without the passage of coproduct effluent to the discharge end thereof, for use in increasing the pressure thereof from said intermediate pressure level to an upper adsorption pressure;

(c) introducing nitrogen copurge gas to the feed end of the bed at said upper adsorption pressure to displace coproduct effluent gas from the discharge end of the bed, a portion of said coproduct effluent gas being introduced to the discharge end of a bed being pressurized from said desorption pressure level, the concentration of nitrogen in said coproduct effluent gas increasing during said copurge step, which is continued until the nitrogen concentration reaches a predetermined level in said coproduct effluent gas stream;

(d) introducing additional nitrogen copurge gas to the feed end of the bed at said upper adsorption pressure after the nitrogen concentration reaches said predetermined level in said effluent gas stream, with the additional displaced effluent gas containing more than the said predetermined level of nitrogen concentration therein being recycled to the feed end of a bed in the system that is being repressurized from said intermediate pressure level to said upper adsorption pressure and/or to said bed at the upper pressure level;

(e) countercurrently depressurizing said bed from the upper adsorption pressure to a lower pressure with discharge of a nitrogen-rich gas from the feed end of the bed, said discharged nitrogen-rich gas comprising nitrogen copurge gas and/or nitrogen product gas;

(f) further countercurrently depressurizing said bed by evacuation from said lower pressure to subatmospheric desorption pressure with discharge of desorbed, high purity gas comprising nitrogen product gas and/or copurge gas from the feed end of the bed, and

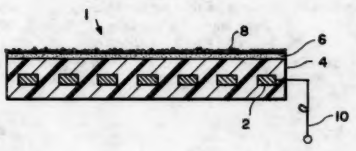
(g) repeating steps (a)–(f) on a cyclic basis with additional feed air being passed to the bed being repressurized during step (b) or during steps (a) and (b), whereby product nitrogen can be readily obtained at high purity and recovery levels, and an oxygen-enriched coproduct can also be obtained at relatively high recovery levels.

4,599,095

THIN BED SORPTION/DESORPTION APPARATUS AND METHOD FOR MAKING THE SAME

David A. Barnes, Seminole, and Eugene L. Szonntagh, Largo, both of Fla., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 22, 1984, Ser. No. 663,109
Int. Cl.[4] B01D *35/18, 53/04*
U.S. Cl. 55—208 **12 Claims**



4. A sorption/desorption bed comprising

a thin film heater element,

a chemically inert, high temperature laminate encapsulating the heater element,

a high temperature adhesive on an outside surface of said laminate and

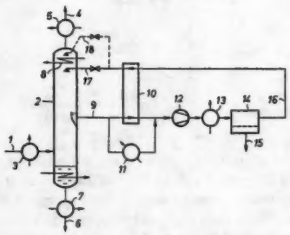
thin coating of a sorptive material on an outside surface of said adhesive to provide a sorptive outside surface for the bed in close thermal contact with the thin film heater element so that there is a large surface area of the sorptive material and a small thermal mass for quick heating and cooling.

4,599,096

PROCESS FOR FRACTIONATION OF A GASEOUS MIXTURE EMPLOYING SIDE STREAM WITHDRAWAL, SEPARATION, AND RECYCLE

Peter S. Burr, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed May 16, 1984, Ser. No. 610,725
Claims priority, application Fed. Rep. of Germany, May 20, 1983, 3318529
Int. Cl.[4] F25J *3/02*
U.S. Cl. 62—27 **15 Claims**



1. A process for fractionating a gaseous mixture by distillation in a fractionating column wherein, during distillation, at least two components of the gaseous mixture are present in a sufficient concentration to form a substantially azeotropic mixture in the absence of a preventative step, said process comprising withdrawing a side stream fluid from the column during fractionation, and separating said side stream fluid so as to remove preferentially at least a portion of one of the components of the substantially azeotropic mixture and recycling resultant depleted side stream to said fractionating column at a point below the point of withdrawal of said side stream.

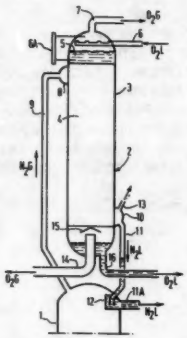
7. A process for fractionating a gaseous mixture by distillation in a fractionating column, said gaseous mixture consisting essentially of about 5–20% methane, about 50–90% carbon dioxide, and about 2–10% ethane, wherein, during distillation, CO_2 is present in the fractionating column in a sufficient concentration to freeze out as a solid under distillation conditions in the column in the absence of a preventive step, said process comprising fractionating the mixture to obtain a methane-enriched overhead and a CO_2 enriched bottoms fraction, withdrawing a sidestream liquid from the column during fractionation, said sidestream liquid being withdrawn at a point where ethane is enriched in the liquid and where CO_2 is present in a lower concentration than in the bottoms fraction, and separating said sidestream liquid so as to remove preferentially the CO_2 and recycling resultant CO_2-depleted stream further enriched in ethane to said fractionating column, said depleted stream having a higher dissolving capacity for CO_2 than the stream withdrawn.

4,599,097

PROCESS AND DEVICE FOR VAPORIZING A LIQUID BY HEAT EXCHANGE WITH A SECOND FLUID AND THEIR APPLICATION IN AN AIR DISTILLATION INSTALLATION

Pierre Petit, Chatenay Malabry; Maurice Grenier, Paris, and Jean-Francois Deschamps, Bures-sur-Yvette, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes George Claude, Paris, France

Filed Jun. 12, 1984, Ser. No. 620,078
Claims priority, application France, Jun. 24, 1983, 83 10472
Int. Cl.[4] F25J *3/02*
U.S. Cl. 62—36 28 Claims



1. A process comprising vaporizing a liquid by heat exchange with a second fluid by means of a heat exchanger designed to maintain no more than a small temperature difference between said liquid and said second fluid, including a parallelepipedal body formed by an assembly of parallel vertical plates defining therebetween a multitude of flat passages having generally vertical corrugated fins therein, by sending said liquid into a first group of said passages and sensing the second fluid into a second group of passages constituting the remaining passages of said passages defined between said plates, distributing the liquid in two stages at an upper end of the passages of said first group of passages throughout the horizontal length of said first group of passages, said two stages comprising a rough predistribution of the liquid throughout the length of passages of said first group of passages, and then a fine distribution of the thus predistributed liquid throughout the length of said passages, the two stages being performed above an upper end of said generally vertical corrugated fins.

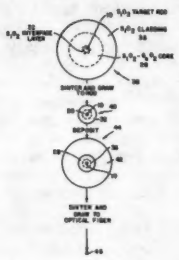
9. A heat exchanger comprising means designed for vaporizing a liquid by heat exchange with a second fluid while maintaining no more than a small temperature difference between said liquid and said second fluid, said exchanger including a parallelepipedal body including an assembly of parallel vertical plates having walls defining therebetween a multitude of flat passages having generally vertical corrugated fins therein, said passages comprising a first group of said passages and a second group of passages constituting the remainder of said passages defined by said walls of said plates, means for effecting a rough predistribution of the liquid, means for effecting a fine distribution of the liquid, the means for effecting the predistribution of the liquid opening onto said means for effecting the fine distribution of the liquid which are disposed at an upper end of each of the passages of said first group of passages, both said means being disposed above an upper end of said generally vertical corrugated fins.

4,599,098

OPTICAL FIBER AND METHOD OF PRODUCING SAME

Arnab Sarkar, Westhills, Calif., assignor to Lightwave Technologies, Inc., Van Nuys, Calif.

Filed Feb. 13, 1984, Ser. No. 579,496
Int. Cl.[4] C03B *37/018*
U.S. Cl. 65—3.12 9 Claims



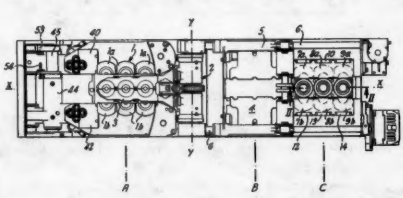
1. A process for producing optical fiber which comprises:
depositing a soot comprising silica by vapor deposition along the length of a rotating thin silica target rod, to produce a first porous preform having both core and cladding portions;
sintering said first porous preform with said target rod in place.
drawing said sintered preform to a rod, to diminish the dimensions of said thin target rod,
depositing a soot comprising silica on said drawn rod by vapor deposition along the length of said drawn rod to produce a fiber preform having both sintered and porous portions;
sintering said fiber preform with said drawn rod remaining in place; and
drawing said sintered fiber preform to further diminish the dimensions of said thin target rod and to provide an optical fiber.

4,599,099

CYCLIC PROCESS OF FORMING GLASSWARE IN AN INDIVIDUAL SECTION GLASSWARE FORMING MACHINE

Stanley P. Jones, Tickhill, England, assignor to Emhart Industries, Inc., Farmington, Conn.

PCT No. PCT/GB82/00053, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO82/02885, PCT Pub. Date Sep. 2, 1982
PCT Filed Feb. 22, 1982, Ser. No. 433,124
Claims priority, application United Kingdom, Feb. 27, 1981, 8106180
The portion of the term of this patent subsequent to Apr. 17, 2001, has been disclaimed.
Int. Cl.[4] C03B *11/16, 9/40*
U.S. Cl. 65—29 4 Claims



1. An improved cyclic process for forming glassware in an

individual section glassware forming machine, in which each machine section has three stations spaced apart longitudinally, including the steps of forming a parison from a gob of molten glass in a blank mold at a blank station; transferring the parison from the blank station to an intermediate reheating station in which reheating of the parison takes place; transferring the reheated parison from the intermediate station to a shaping station; shaping an article of glassware from the reheated parison in a blow mold at the shaping station; and transferring the article of glassware from the shaping station to a takeout position; wherein the improvement comprises the steps of:

monitoring the formation of parisons at said blank station to derive a blank station condition signal representative of the position of a part of said blank mold at a time when said blank mold should be closed;

comparing said blank station condition signal with a predetermined blank standard representative of a desired closed position of the blank mold part, and inhibiting further parison formation if and only if said blank station condition signal falls outside said predetermined blank standard;

monitoring the shaping of articles at said shaping station to derive a shaping station condition signal representative of the position of a part of said blow mold at a time when said blow mold should be closed; and

comparing said shaping station condition signal with a predetermined shaping standard representative of a desired closed position of said blow mold part, and inhibiting further shaping of articles if and only if said shaping station condition signal falls outside said predetermined shaping standard,

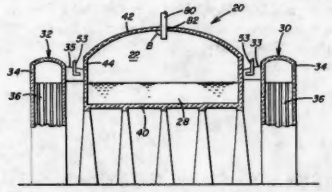
wherein the predetermined blank standard and the predetermined shaping standard are each averages of a selected number of immediately preceding positions of the respective mold part when the respective mold should be closed.

4,599,100

MELTING GLASS WITH PORT AND MELTER BURNERS FOR NO_x CONTROL

Henry M. Demarest, Jr., Natrona Heights, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 1, 1985, Ser. No. 718,622
Int. Cl.[4] C03B 5/16, 5/44
U.S. Cl. 65—134 **10 Claims**



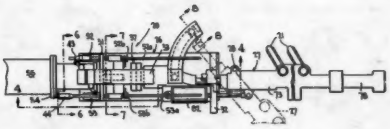
1. A method for reducing NO_x emissions from a glassmaking furnace in which fuel is mixed with an amount of oxygen in excess of the stoichiometric amount required to effect complete combustion of the fuel to issue an O_2 rich primary flame into the melting chamber of the furnace to melt a glass charge held in the melting chamber and further, to provide a protective O_2 rich region above the molten glass charge, comprising the step of injecting additional fuel into the melting chamber at a location above the primary flame in such a manner as to provide a fuel rich region above said O_2 rich region and low overall excess oxygen in the melting chamber, said additional fuel being injected at a flow rate and in a volume sufficient to consume at least a portion of said excess oxygen and reduce the amount of NO_x present in the melting chamber, to thereby reduce NO_x emissions.

4,599,101

UNIVERSAL SERVO-DRIVEN GOB DISTRIBUTOR

Robert J. Douglas, North Granby; Robert L. Doughty, West Hartford; John P. Mungovan, Simsbury; Robert P. Andersen, Monroe, and Vaughan Abbott, North Granby, all of Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed May 15, 1985, Ser. No. 734,096
Int. Cl.[4] C03B 7/08
U.S. Cl. 65—164 **19 Claims**



1. A gob distributor for conveying in a preselected sequence successively formed groups of glass gobs to fixed troughs groups, each glass gob group including one or more glass gobs and each trough group including a number of troughs corresponding to the number of glass gobs in each glass gob group, said gob distributor comprising a group of scoops, the number of scoops in said group of scoops also corresponding to the number of glass gobs in each glass gob group, each scoop having a pivot axis, a pinion fixed to each scoop for rotation about said pivot axis, a rack engaged with each rack pinion for positioning said scoop group in a preselected sequence with said trough groups, and improved positioning means for longitudinally shifting and positioning said rack; said improved positioning means comprising a servomotor having a shaft coupled to said rack by a rotary to linear drive unit, and a position-control servo mechanism drive electrically coupled to said servomotor for controlling the rotational position of said servomotor shaft.

4,599,102

TRIAZONE FERTILIZER AND METHOD OF MAKING

Edwin F. Hawkins, Baton Rouge, La., assignor to Arcadian Corporation, Parsippany, N.J.

Continuation-in-part of Ser. No. 644,975, Aug. 28, 1984, Pat. No. 4,554,005, and a continuation-in-part of Ser. No. 757,807, Jul. 22, 1985, abandoned. This application Oct. 7, 1985, Ser. No. 785,246
The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.
Int. Cl.[4] C05C 9/00
U.S. Cl. 71—30 **35 Claims**

1. A liquid fertilizer composition consisting essentially of: as calculated on a dry weight basis of 100% solids, triazone composition that is substantially soluble in water, present at at-least about 30% (dry weight), urea-type compound present in an amount of at-least about 10% up to about 50% (dry weight) such that a weight ratio of amount of triazone-type compound present relative to amount of said urea-type compound present is at-least about 0.48, methylenediurea-type compound up to about 3% (dry weight), monomethylolurea-type compound up to about 6% (dry weight) with total weight (dry weight) of methylene compound and monomethylolurea-type compound up to about 10%, hexamethylenetetramine-type compound up to about 2% (dry weight), and water in an amount at-least sufficient for solution of said triazone composition, said urea-type compound, said methylenediurea-type compound, said monomethylolurea-type compound and said hexamethylenetetramine-type compound being dissolved therein, and said triazone composition on a dry weight basis, relative to said methylenediurea-type compound, being at a ratio of at-least about 6.

4,599,103

AGRICULTURAL UREAS AND ISOUREAS

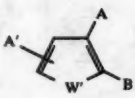
George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 450,214, Dec. 16, 1982, Pat. No. 4,481,029, which is a continuation-in-part of Ser. No. 196,276, Oct. 22, 1980, abandoned, which is a continuation-in-part of Ser. No. 96,723, Nov. 30, 1979, abandoned. This application Oct. 15, 1984, Ser. No. 662,444

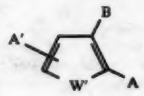
Int. Cl.[4] A01N *47/36*; C07D *405/12, 409/12*

U.S. Cl. 71—90 53 Claims

1. A compound selected from

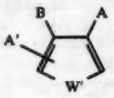


I



II

or



III

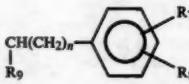
wherein

W' is O or S;

A' is H, Cl, Br, C_1–C_4 alkyl, OCH_3, NO_2 or CF_3;

A is $-C(O)QR^I$ or $-C(T)R^{II}$ where Q is O, S or $-N(R_6)-$;

T is O or $=N-OR^{III}$ where R^{III} is H, C_1–C_4 alkyl or C_3–C_4 alkenyl; when Q is O or S, then R^1 is C_1–C_6 alkyl, C_3–C_6 alkenyl, C_3–C_6 alkynyl, C_2–C_6 alkyl substituted with 1–3 Cl, F, or Br or one of CN or OCH_3, C_3–C_6 alkenyl substituted with 1 ∝ 3 Cl, C_3–C_6 alkynyl substituted with Cl, C_5–C_6 cycloalkyl, cyclohexenyl, cyclohexyl substituted with 1–3 CH_3, C_4–C_7 cycloalkylalkyl or



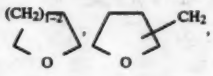
where R_7 and R_8 are independently H, Cl, CH_3 or OCH_3;

n is 0 or 1; and

R_9 is H or CH_3;

when Q is O, then R^I is $CH_2CH_2OR_{15}$, $CH_2CH_2CH_2OR_{15}$, $CH—CH_2OR_{15}$, where R_{15} is C_2H_5, $CH(CH_3)_2$, phenyl, CH_2CH_2Cl, CH_2CCl_3, $(CH_2CH_2O)_nR_{16}$,

where R_{16} is CH_3, C_2H_5, $CH(CH_3)_2$, phenyl, CH_2CH_2Cl, CH_2CCl_3, and n' is 2 or 3, CH_2CN,



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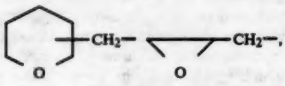
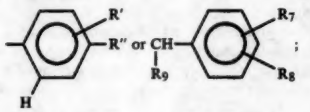


CH_2OR_6, where R_6' is C_1–C_4 alkyl provided R^I has a total of ≦13 carbon atoms when Q is

then R^I is H, C_1–C_6 alkyl, $—CH_2CH_2OR_{10}$, $—CH_2CH_2CH_2OR_{10}$, where R_{10} is CH_3, CH_3CH_2, $CH(CH_3)_2$ or phenyl, C_3–C_6 alkenyl, C_3–C_6 cycloalkyl, C_5–C_6 cycloalkenyl, C_6 cycloalkyl substituted with any one of 1–2 OCH_3, 1–3 CH_3, $—CH_2CH_3$ or CF_3, C_4–C_7 cycloalkylalkyl, $—CH_2CN$, $—CH_2CH_2CN$,

OCH_3, OCH_2CH_3,



where

R' is H, C_1–C_4 alkyl, OCH_3, F, Cl, Br, CN, NO_2 or CF_3;

R'' is H, CH_3, Cl, F or Br;

R_7, R_8 and R_9 are as previously defined;

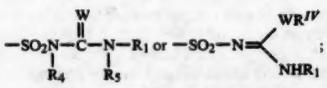
R_6 is H, C_1–C_3 alkyl, CH_2CN, $CH_2CH_2—CN$ or $—CH_2—CH=CH_2$ and R_6 and R^I may be taken together to form $—(CH_2)_4—$, $—(CH_2)_5—$ or $—CH_2CH_2O—CH_2CH_2—$;

with the proviso that when R_6 is CH_2CH_2CN or CH_2CN, then R^I is CH_2CH_2CN or CH_2CN, and then R^I and R_6 have a total carbon atom count of ≦13, and when R^I is OCH_3 or OCH_2CH_3, then R_6 is H, or CH_3;

when A is

then R^{II} is H, C_1–C_6 alkyl, C_3–C_6 alkenyl, phenyl, benzyl, benzyl or phenyl substituted with 1–2 Cl, 1–2 OCH_3, 1–2 CH_3, C_5–C_6 cycloalkyl, C_4–C_7 cycloalkylalkyl with the proviso that when T is $=N—OR^{III}$, then R^{II} must be C_1–C_6 alkyl or C_3–C_6 alkenyl;

B is



where

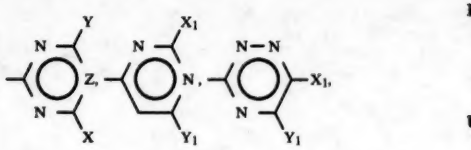
R_4 is H or CH_3;

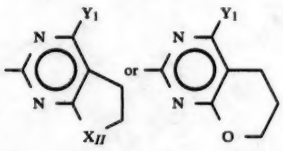
W is O or S;

R_5 is H, or CH_3, with the proviso that either R_4 or R_5 must be H;

R^{IV} is C_1–C_6 alkyl or C_3–C_4 alkenyl;

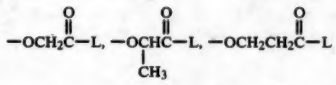
R_1 is





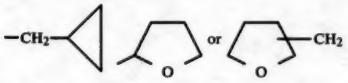
where
Z is CH or C—F;
X is H, Cl, $—CH_3$, $—OCH_3$ or $—OCH_2CH_3$;
Y is H, Cl, C_1–C_4 alkyl, C_1–C_4 alkyl substituted with $—OCH_3$, $—OC_2H_5$, —CN, $—CO_2CH_3$, $—CO_2C_2H_5$,

or 1-3 atoms of F, Cl, Br, C_3–C_4 alkenyl, $—O—(CH_2)_{n'}$, $O—(C_1$–C_3 alkyl) where n' is 2 or 3,



where L is OH, $—NH_2$,

$—NH(C_1$–C_4 alkyl), $—N(C_1$–C_4 alkyl)$_2$ or C_1–C_6 alkoxy, SCN, $—N_3$, $NR_{11}R_{12}$ where R_{11} is H or CH_3 and R_{12} is H, OCH_3, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, $—C_3$–C_4 alkenyl, C_2–C_3 alkyl substituted with OCH_3 or OC_2H_5; C_1–C_2 alkyl substituted with —CN, CO_2H, CO_2CH_3 or $CO_2C_2H_5$, and R_{11} and R_{12} can be taken together to form $—CH_2CH_2CH_2CH_2—$ or $CH_2CH_2OCH_2CH_2—$, $—O—R_9$ where R_9 is C_1–C_4 alkyl, C_2–C_4 alkyl substituted with 1-3 atoms of F, Cl or Br, C_1–C_2 alkyl substituted with cyano, C_3–C_4 alkenyl, $—CH_2C{\equiv}CR_{13}$,



R_{13} is H, CH_3 or CH_2Cl; SR_{14};
where R_{14} is C_1–C_4 alkyl, allyl, propargyl or C_1–C_2 alkyl substituted with CN; with the proviso that when X and Y are both H, then R^I and R^{II} are less than 5 carbons;
X_I is H, Cl, OCH_3, OCH_2CH_3 or CH_3;
Y_I is H, OCH_3 or CH_3; and
X_{II} is O or CH_2
and further provided that when A contains greater than 5 carbon atoms, then Y must contain ≦4 carbon atoms; and their agriculturally suitable salts.

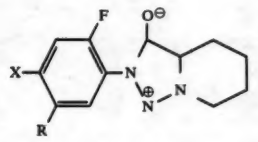
4,599,104

HERBICIDAL PYRIDOTRIAZOLIUM COMPOUNDS

Eiki Nagano, Nishinomiya, and Ryo Yoshida, Kawanishi, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 8, 1984, Ser. No. 577,969
Claims priority, application Japan, Feb. 15, 1983, 58-24333
Int. Cl.[4] A01N *43/90*; C07D *471/04*
U.S. Cl. 71—92 20 Claims

1. A compound of the formula:



wherein R is a hydrogen atom, a C_1–C_4 alkoxy group, a C_3–C_4 alkynyloxy group, a C_3–C_4 alkenyloxy group or a C_1–C_4 alkylthio group and X is a chlorine atom or a bromine atom.

11. A method for controlling weeds which comprises applying a herbicidally effective amount of the compound according to claim 1 to the area where the weeds grow or will grow.

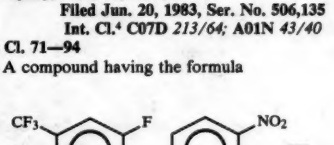
4,599,105

2-[16-(3-FLUORO-5-TRIFLUOROMETHYL-PYRIDINYL-2-OXY)-3-NITRO-PHENOXY]-PROPIONIC ACID DERIVATIVES, HERBICIDAL COMPOSITIONS CONTAINING SAME AND HERBICIDAL METHOD OF USE

Sudarshan K. Malhotra, Walnut Creek, and B. Clifford Gerwick, III, Concord, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

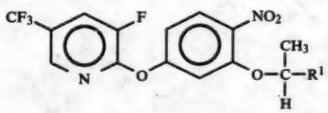
Filed Jun. 20, 1983, Ser. No. 506,135
Int. Cl.[4] C07D *213/64*; A01N *43/40*
U.S. Cl. 71—94 6 Claims

1. A compound having the formula



wherein R^1 is a carboxylic acid group or an alkali or alkaline earth metal salt thereof.

3. The method of controlling undesired plant growth which comprises applying to the locus of said plants a herbicidally effective amount of a compound having the formula



wherein R^1 is a carboxylic acid group or an alkali or alkaline earth metal salt thereof.

4,599,106
SUBSTITUTED ALKANETHIOCARBOXYLIC ACID DERIVATIVES AND HERBICIDAL USE THEREOF

Heinz Förster, Wuppertal; Ludwig Eue, Leverkusen, and Robert R. Schmidt, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

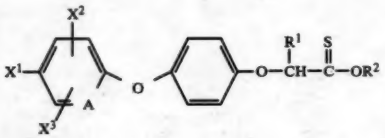
Division of Ser. No. 575,963, Feb. 1, 1984. This application May 22, 1985, Ser. No. 736,748

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1983, 3304204

Int. Cl.[4] A01N *37/00*; C07C *153/11*

U.S. Cl. 71—100 15 Claims

1. A substituted alkanethiocarboxylic acid derivative of the formula



in which

A represents a —CH-grouping,

X^1 represents hydrogen, trifluoromethyl or chlorine,

X^2 represents hydrogen, trifluoromethyl or chlorine,

X^3 represents hydrogen, trifluoromethyl or chlorine,

R^1 represents hydrogen or methyl and

R^2 represents hydrogen, or represents alkyl which has 1 to 6 carbon atoms and is optionally substituted by hydroxyl, halogen, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_3–C_6-cycloalkyl, amino, alkylamino with 1 to 4 carbon atoms, dialkylamino with 1 to 4 carbon atoms per alkyl radical and/or saturated 5-membered or 6-membered heterocyclic radicals which are bonded via nitrogen and contain up to 3 nitrogen and/or oxygen atoms, or represents alkenyl which is optionally substituted by fluorine, chlorine, bromine and/or iodine, or represents alkinyl which is optionally substituted by fluorine, chlorine, bromine and/or iodine, or represents phenyl which is optionally substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkythio, C_1–C_4-alkoxy, cyano and/or nitro, or represents benzyl which is optionally substituted by halogen, C_1–C_4-alkylthio, C_1–C_4-alkoxy, cyano and/or nitro, or represents phenethyl which is optionally substituted in the phenyl part by halogen, C_1–C_4-alkyl, C_1–C_4-alkylthio, C_1–C_4-alkoxy, cyano and/or nitro, or represents phenyl-(C_1–C_4)-alkoxy-(C_1–C_4)-alkyl which is optionally substituted in the phenyl part by halogen, C_1–C_4-alkyl, C_1–C_4-alkylthio, C_1–C_4-alkoxy, cyano and/or nitro, or represents cycloalkyl which has 3 to 6 carbon atoms and is optionally substituted by alkyl with 1 to 4 atoms and/or halogen.

13. A process for combating weeds which comprises applying to the weeds or their habitat a substantial alkanethiocarboxylic acid derivative according to claim 1 in a herbicidally effective amount.

4,599,107
METHOD FOR CONTROLLING SECONDARY TOP-BLOWN OXYGEN IN SUBSURFACE PNEUMATIC STEEL REFINING

Ian F. Masterson, Danbury, Conn., assignor to Union Carbide Corporation, Danbury, Conn.

Filed May 20, 1985, Ser. No. 735,741

Int. Cl.[4] C21C *5/32*, *5/34*

U.S. Cl. 75—59.2 15 Claims

1. A method for refining a carbon-containing steel melt in a refining vessel, comprising:

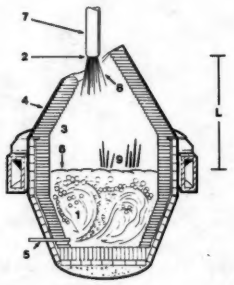
(a) injecting oxygen into the steel melt from below the bath surface:

(d) reacting at least some of the subsurface injected oxygen with carbon in the melt to produce carbon monoxide which rises up through and out of the bath;

(c) injecting oxygen through a lance into the headspace above the bath surface;

(d) reacting a first portion P of the top-injected oxygen with components in the bath wherein

$$P = K - (1629/\text{sec})\,(L/V)$$



where P is the percent of top-injected oxygen which reacts with bath components, L is the height of the lance opening above the bath surface in feet, V is the velocity of the oxygen injected from the lance in feet per second, and K is a constant having a value of from 56 to 72; and

(e) reacting remaining top-injected oxygen with said rising carbon monoxide in the headspace above the bath surface to exothermically produce carbon dioxide.

4,599,108
METHOD FOR PROCESSING SULPHIDE CONCENTRATES AND SULPHIDE ORES INTO RAW MATERIAL

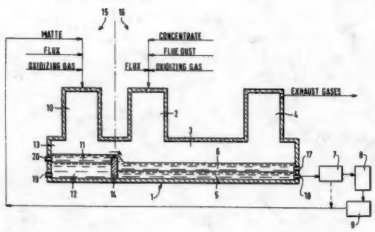
Teuvo P. T. Hanniala, Espoo, Finland, assignor to Outokumpu, Oy, Helsinki, Finland

Filed Jul. 10, 1985, Ser. No. 753,399

Claims priority, application Finland, Jul. 18, 1984, 842882

Int. Cl.[4] C22B *15/00*

U.S. Cl. 75—73 6 Claims



1. A method for processing sulphide concentrates and sulphide ores into raw metal within the same process unit, in which method the feed composed of the sulphide material to be treated, flux and oxidizing gases, is processed in the smelting zone of the process unit into a molten slag phase and molten sulphide matte, and where the molten slag phase and molten sulphide matte are both discharged through specific tap holes and wherein the molten matte removed from the furnace is solidified into solid particles, and the resulting solid matte is converted into raw metal, comprising returning finely-ground, solid matte back into the process unit through a converting

shaft together with the flux and oxidizing gases in order to convert the matte into raw metal, and creating in a settler of a converting zone an equilibrium between two molten phases and discharging exhaust gases both from the converting zone and a smelting zone through a common uptake shaft, and preventing mixing together of the molten phases located in the settler of the converting zone and in a settler of the converting zone and in a settler of the smelting zone at least partially.

4,599,109

HIGH HARDNESS AND HIGH TOUGHNESS NITRIDING POWDER METALLURGICAL HIGH-SPEED STEEL

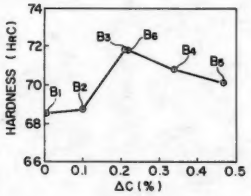
Nobuyasu Kawai, Kobe; Minoru Hirano, Nishinomiya; Hiromune Manto, Kobe; Hajime Esaka, Akashi, and Hirofumi Fujimoto, Ono, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jun. 18, 1985, Ser. No. 746,124

Claims priority, application Japan, Jun. 20, 1984, 59-128288

Int. Cl.[4] C22C *29/04*

U.S. Cl. 75—238 4 Claims



1. A high hardness and high toughness nitriding powder metallurgical high-speed steel comprising, in weight %,

C: in a quantity (%) which satisfies formula

$$Ceq+0.15 \leqq C+12/14N \leqq Ceq+0.35$$

where Ceq=0.19+0.017(W+2Mo)+0.22V, and

N, W, Mo and V are respectively the content (%) in steel:

Cr: 3–5%	V: 4.0–6.0%
Mo: 8–12%	Co: 5–15%
W: 8–14%	N: 0.2–1.2%

and the remainder is Fe, and (W+2Mo) is 27–32%.

4,599,110

PROCESS FOR THE PRODUCTION OF VALVE SEAT RINGS

Michael Köhler, Wetter-Wengern, and Wolfgang Petry, Bochum, both of Fed. Rep. of Germany, assignors to Bleistahl G.m.b.H., Wetter-Wengern, Fed. Rep. of Germany

Filed Apr. 11, 1985, Ser. No. 721,888

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1984, 3413593

Int. Cl.[4] C22C *29/00*

U.S. Cl. 75—243 3 Claims

1. In the process for the production of sintered valve seat rings wherein a powder mixture containing 0.8% to 1.5% by weight graphite, 1.0% to 4% by weight lead, 0.5% to 5% by weight nickel, 1.2% to 1.8% by weight molybdenum, 9.6% to 14.4% by weight cobalt, and the remainder iron, is pressed into valve seat rings at a pressing force of between 40 and 60 KN/cm^2 and are then sintered in a neutral atmosphere at a temperature of 1100° C. to 1200° C. and finally compressed at a pressing force above 120 KN/cm^2;

the improvement in said process comprising adding to said powder mixture about 0.5% to 1.5% by weight molybdenum disulfide, whereby the molybdenum disulfide will disintegrate when sintering and form new compounds improving the homogeneous distribution of the cobalt powder in the sintered material.

4,599,111

DESENSITIZING INK FOR WET OFFSET PRINTING

Albert Amon, and Roger Weil, both of Lausanne, Switzerland, assignors to Sicpa Holding S.A., Switzerland

PCT No. PCT/EP84/00122, § 371 Date Oct. 24, 1984, § 102(e) Date Oct. 24, 1984, PCT Pub. No. WO84/03663, PCT Pub. Date Sep. 27, 1984

PCT Filed Mar. 12, 1984, Ser. No. 668,379

Claims priority, application Switzerland, Mar. 16, 1983, 1443/83

Int. Cl.[4] C09D *11/00*

U.S. Cl. 106—21 8 Claims

1. A densensitizing ink for wet offset priting on an acceptor surface of a chemical duplicating set comprising a nucleophilic alkoxylated compound, characterized in that the nucleophilic alkoxylated compound is bridged as a polyurethane in order to increase its molecular weight and improve the ink transfer on the inking rollers.

4,599,112

RECORDING LIQUID

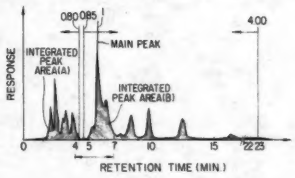
Yasumasa Yokoyama, Yokohama; Tomoko Komori, Machida; Tsuyoshi Eida, Ichikawa; Shoji Koike, and Masatsune Kobayashi, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 516,966, Jul. 25, 1983, abandoned. This application Oct. 31, 1984, Ser. No. 666,137

Claims priority, application Japan, Dec. 29, 1982, 57-229581

Int. Cl.[4] C09D *11/02*

U.S. Cl. 106—22 5 Claims



1. A recording liquid containing as a coloring component a copper phthalocyanine dye having at least one alkali metal sulfonate substituent, characterized in that the ratio of the integrated peak areas (A/B) in a liquid chromatogram of said dye is at least 1/6, wherein, provided that the retention time of the main peak is taken as 1.00, A represents the integrated peak area of the relative retention time of from 0 to 0.80, and B represents the integrated peak area of the relative retention time of from 0.85 to 4.00.

4,599,113

ISOINDOLINE PIGMENT HAVING A HIGH COLOR STRENGTH

Wolfgang Lotsch, Beindersheim, and Georg Henning, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 26, 1984, Ser. No. 634,432

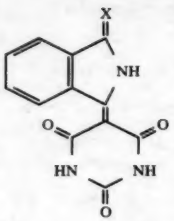
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1983, 3327563

Int. Cl.[4] C09B *57/04;* C07D *239/62, 471/02*

U.S. Cl. 106—288 Q 16 Claims

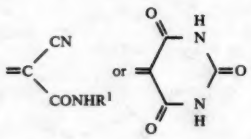
1. An isoindoline pigment having high color strength and containing

(a) a compound of the formula



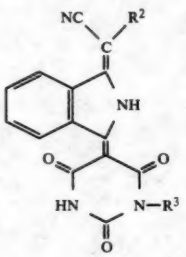
(I)

where X is



and R^1 is hydrogen or methyl, and

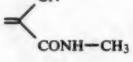
(b) from 2 to 50% by weight, based on (a), of one or more isoindoline compounds of the formula



(II)

where R^2 is —CN, —CONH—R^4, 2-quinazolonyl, 2-quinoxazolonyl or 2-benzimidazolyl, R^3 is hydrogen or C_1–C_4-alkyl or is phenyl which is unsubstituted or substituted by chlorine, bromine, methyl, ethyl, methoxy or ethoxy, R^4 is hydrogen, C_1–C_4-alkyl or phenyl, and the phenyl radical R^4 and the heterocyclic radicals stated for R^2 are unsubstituted or substituted by chlorine, fluorine, bromine, carbamyl, N-C_1–C_4-alkylcarbamyl, N-phenylcarbamyl, C_1–C_4-alkyl, C_1–C_4-alkoxy, benzoylamino, C_1–C_4-alkanoylamino, C_1–C_4-alkoxycarbonyl or phenoxycarbonyl, and when X is

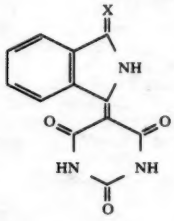
R^3 or R^4 cannot be hydrogen, or when X is



R^3 cannot be hydrogen, where the pigment is obtained by dry-blending a mixture of (I) and (II) until the primary particles are ≦0.2 μm, and then heating the finely divided agglomerated mill base in an organic liquid or in a mixture of water with an organic liquid selected from the group consisting of aliphotic alcohols, cycloaliphatic alcohols, esters, alphatic carboxylic acids, aliphatic carboxamides, lactams, ethers, ketones, phenols and mixtures thereof or in a mixture of water with said organic liquid.

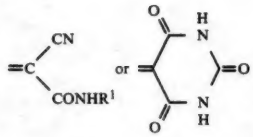
14. A process for the preparation of an isoindoline pigment having high color strength, wherein a mixture of:

(a) an isoindoline compound of the formula:



(I)

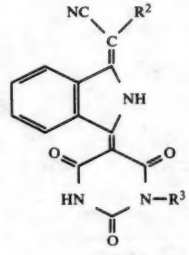
where X is



and

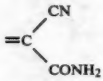
R^1 is hydrogen or methyl, and

(b) from 2 to 50% by weight, based on (a), of one or more isoindoline compounds of the formula



(II)

where R^2 is —CN, —CONH—R^4, 2-quinazolonyl, 2-quinoxazolonyl or 2-benzimidazolyl, R^3 is hydrogen or C_1–C_4-alkyl or is phenyl, which is unsubstituted or substituted by chlorine, bromine, methyl, ethyl, methoxy or ethoxy and R^4 is hydrogen, C_1–C_4-alkyl or phenyl, and the phenyl radical R^4 and the heterocyclic radicals stated for R^2 are unsubstituted or substituted by chlorine, fluorine, bromine, carbamyl, N-C_1–C_4-alkylcarbamyl, N-phenylcarbamyl, C_1–C_4-alkyl, C_1–C_4-alkoxy, benzoylamino, C_1–C_4-alkanoylamino, C_1–C_4-alkoxycarbonyl or phenoxycarbonyl, and when X is



R^3 or R^4 cannot be hydrogen, or when X is

R^3 cannot be hydrogen, is dry-blended until the primary particles are ≦0.2 μm in size, and the finished mill base which consists of agglomerates of from 1 to ≦200 μm, which are composed of the primary particles, is heated at from 50° to 200° C. in an organic liquid selected from the group consisting of aliphatic alcohols, cycloaliphatic alcohols, esters, aliphatic carboxylic acids, aliphatic carboxamides, lactams, ethers, ketones, phenols and mixtures thereof or in a mixture of said organic liquid with water, and the pigment is isolated.

4,599,114

TREATMENT OF TITANIUM DIOXIDE AND OTHER PIGMENTS TO IMPROVE DISPERSIBILITY

George K. Atkinson, P.O. Box 1684, Laurel, Miss. 39440

Filed Feb. 11, 1985, Ser. No. 700,891
Int. Cl.[4] C09C *1/36*
U.S. Cl. 106—300 **32 Claims**

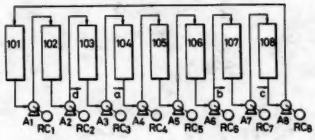
1. The composition comprising titanium dioxide particles containing on their surfaces a surfactant, said surfactant being present on said surfaces in an amount sufficient to improve the dispersibility of said particles in a resin medium, a plastic medium, a paper making composition, or a reinforced plastic composite composition, wherein the surfactant consists of the reaction product of: a Diamine, a Carboxylic Acid, and a Fatty Acid.

4,599,115

METHOD FOR CONTROLLING SIMULATED MOVING BED SYSTEM

Masao Ando, Saitama, and Masatake Tanimura, Kanagawa, both of Japan, assignors to Mitsubishi-Kasei Technoengineers Ltd., Tokyo, Japan

Filed Jul. 24, 1984, Ser. No. 634,006
Claims priority, application Japan, Aug. 12, 1983, 58-147712
Int. Cl.[4] C13J *1/06, 1/08*
U.S. Cl. 127—46.1 **4 Claims**



1. In a method for controlling a simulated moving bed system comprising at least four series-arranged beds each packed with a solid adsorbent, with the downstream end of each bed and the upstream end of the next succeeding bed being connected by conduits to form an endless loop, and in which a fluid feed stock, a fluid desorbent, a fluid raffinate and a fluid sorbate is caused to circulate through said beds in one direction, said fluid feed stock and said fluid desorbent are introduced into the system while at the same time said fluid raffinate and said fluid sorbate are withdrawn from said system, and the positions of introduction and withdrawal of said fluids are periodically shifted in the direction of the circulating fluid flow, the improvement wherein two or more circulating pumps provided with variable speed controllers and pressure detectors for detecting a suction pressure of each of said circulating pumps are disposed between two beds, flow rates of three of the fluids introduced into or withdrawn from the system are adjusted to predetermined values and a flow rate of the other fluid is controlled in such a manner that the suction pressure of one of said circulating pumps is held constant, and a rotational speed of each of said circulating pumps is controlled independently so as to control the flow rate of the circulating fluid and to maintain the suction pressure of each circulating pump at a low level.

4,599,116

ALKALINE CLEANING PROCESS

Peter F. King, Farmington Hills; Samuel T. Farina, Mt. Clemens, and Karl A. Korinek, Troy, all of Mich., assignors to Parker Chemical Company, Madison Heights, Mich.

Filed Nov. 8, 1984, Ser. No. 669,491
Int. Cl.[4] C23G *1/14*
U.S. Cl. 134—2 **21 Claims**

1. In a process for the alkaline cleaning of aluminum containers having aluminum fines and organic soils on the surfaces thereof, which process includes contacting said surfaces with an aqueous alkaline cleaning composition for a period of time sufficient to remove substantially all of the aluminum fines and organic soils on the surfaces thereof and thereafter rinsing the cleaned surfaces with an aqueous based at least partially recirculated rinse solution to remove residual cleaning composition from the surfaces thereof, during which process portions of the alkaline cleaning composition are carried into the rinse solution causing a buildup in the alkalinity of the rinse solution;

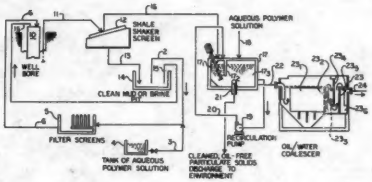
the improvement comprising adding an acidic component to said rinse solution in amounts sufficient to maintain the pH value of said rinse solution at a value less than about 7.5 to prevent said buildup and substantially eliminate the formation of brown oxide stains on said cleaned surfaces.

4,599,117

PROCESS FOR THE DECONTAMINATION OF OIL-CONTAMINATED PARTICULATE SOLIDS

S. Roy Luxemburg, 10530-424 Florida Blvd., Baton Rouge, La. 70815

Continuation-in-part of Ser. No. 346,202, Feb. 5, 1982, Pat. No. 4,451,377. This application May 29, 1984, Ser. No. 614,816
Int. Cl.[4] B08B *7/04*
U.S. Cl. 134—25.1 **7 Claims**



1. A process for cleaning oil-contaminated particulate solids, which comprises

adding said oil-contaminated solids to the first compartment of a water filled compartmented vessel, the compartments of which are separated by a baffle, with the first compartment containing one or more screws capable of pulverizing said particulate solids, and the water of one compartment admixing with water in the other,

adding to a compartment of the vessel, an effective amount of a water soluble polymer selected from the group consisting of polyacrylamides, poly(acrylic acid), poly (ethylene oxide) resins, polyvinyl alochol, carboxymethylcellulose, carrageenan gums, and guar gums, to separate the oil from said solids and deumulsify said oil,

pulverizing and reducing in size the solids added to said first compartment with said screws,

passing said solids under said baffle and separating oil as an oil-in-water emulsion from said solids,

separating oil-free solids from the second compartment of the vessel of water, and

passing said oil and water emulsion from said compartmented vessel and demulsifying same for recovery of the oil as a separate phase.

4,599,118

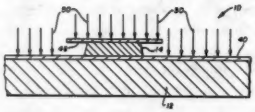
METHOD OF MAKING MOSFET BY MULTIPLE IMPLANTATIONS FOLLOWED BY A DIFFUSION STEP

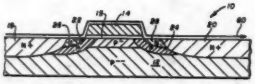
Yu-Pin Han, Dallas, and Tsiu C. Chan, Carrollton, both of Tex., assignors to Mostek Corporation, Carrollton, Tex.

Division of Ser. No. 335,608, Dec. 30, 1981, abandoned. This application Sep. 24, 1984, Ser. No. 654,281

Int. Cl.[4] H01L *21/265, 21/308*

U.S. Cl. 148—1.5 2 Claims





1. A method for manufacturing a metal oxide semiconductor transistor device comprising:

providing a semiconductor substrate of a first conductivity type;

forming a first insulating layer of silicon dioxide on an active surface of the substrate;

implanting ions of a first conductivity type into said substrate;

depositing a layer of polysilicon on said first insulating layer;

implanting ions of a second conductivity type through said polysilicon layer;

growing a second region of silicon dioxide, said silicon dioxide region being grown over said polysilicon layer;

placing a photoresistive mask over said second oxidation layer for forming a gate of the semiconductor device;

etching a predetermined portion of said second oxidation layer;

plasma etching said polysilicon layer;

removing a predetermined portion of said polysilicon layer underneath said second silicon dioxide layer;

etching said second layer of silicon dioxide;

stripping said photoresist area from said second oxidation layer;

implanting ions of the second conductivity type;

implanting ions of the first conductivity type;

etching said second layer of silicon dioxide overhanging said polysilicon gate layer;

etching said first layer of silicon dioxide surrounding said polysilicon gate layer;

implanting ions of said first conductivity type;

implanting ions of said second conductivity type;

diffusing the implanted ions into said substrate; and

oxidizing the active surface of said substrate, including said polysilicon gate.

4,599,119

AGE-HARDENING COPPER TITANIUM ALLOY

Kazuo Ikushima; Yoshio Itoh, and Toshiaki Ishihara, all of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Nov. 13, 1984, Ser. No. 671,010

Claims priority, application Japan, Nov. 22, 1983, 58-220138

Int. Cl.[4] C22C *9/01*

U.S. Cl. 148—411 6 Claims

1. An age-hardened copper titanium alloy comprising a substantially fully solution heat-treated structure including 2 to 6% by weight of titanium and the remainder being copper, and having an average crystal grain size of not greater than 25 microns, said copper titanium alloy being produced by casting a copper titanium alloy melt, working the cast alloy at least in a hot condition, annealing the worked alloy, and subjecting the annealed alloy to a solution heat treatment, said annealing occurring at a temperature of 500° C. to 700° C. for a time period of one to twenty hours, wherein elongation of said alloy in a rolling direction as compared with elongation in a direction perpendicular to said rolling direction having a difference of within 20%, and a bend formability of said alloy in said rolling direction as compared with a bend formability in said perpendicular direction are substantially equal to each other.

4,599,120

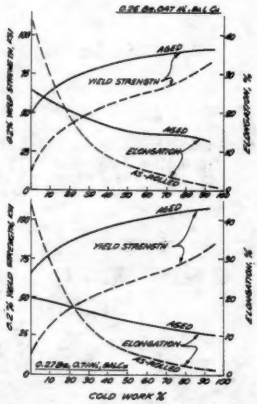
PROCESSING OF COPPER ALLOYS

Nathan L. Church, Chagrin Falls; W. Raymond Cribb, Mentor, and John C. Harkness, Lakewood, all of Ohio, assignors to Brush Wellman Inc., Cleveland, Ohio

Filed Feb. 25, 1985, Ser. No. 704,608

Int. Cl.[4] C22F *1/08*

U.S. Cl. 148—414 5 Claims



1. An article made from wrought copper-beryllium alloy material consisting essentially of about 0.05% to about 0.5% beryllium, about 0.05% to about 1% nickel where cobalt may be substituted for up to one-half of said nickel content at a substitution ratio of about 1 part by weight cobalt for about 2 parts by weight nickel, and the balance essentially copper by solution treating said alloy in wrought intermediate form at a temperature between about 1600° F. (870° C.) and about 1850° F. (1000° C.) for a time sufficient to effect recrystallization and solid solution of that portion of the alloying elements capable of contributing to precipitation hardening, subjecting said solution treated alloy to a final cold reduction of at least about 50% and aging said cold worked alloy at a temperature in the range of about 600° F. (315° C.) to about 1000° F. (540° C.) for less than one to about 8 hours to effect precipitation hardening with accompanying substantial increase in stress relaxation resistance, formability, ductility, conductivity and strength.

4,599,121

METHOD OF PRODUCING LEAKY COAXIAL CABLE

Hugh A. Edwards, Renfrew, and John W. Patchell, Carleton Place, both of Canada, assignors to Allied Corporation, Kanata, Canada and Senstar Security Systems Corporation, Morris Township, N.J.

Filed Sep. 19, 1983, Ser. No. 533,853
Int. Cl.[4] H01B *13/26*
U.S. Cl. 156—48 14 Claims

1. A method of making a leaky coaxial cable comprising:
(a) preparing a conductive axial wire covered by an insulating dielectric,
(b) progressively braiding a conductive braid shield around the dielectric, and
(c) dropping ends of the braid according to a predefined schedule for successive lengths of the braid shield, to produce progressively larger gaps in the braid shield as the ends are dropped whereby graded leakage of signal carried by the cable is facilitated.

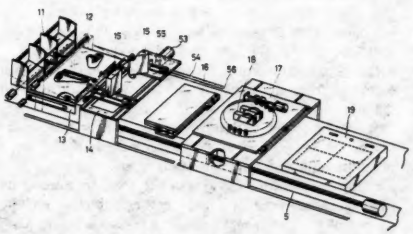
2. A method as defined in claim 1 including the further steps of covering the braid with a flooding agent, covering the flooded braid with an insulating protective jacket, and causing the flooding agent to solidify.

4,599,122

METHOD OF TAPING SEPARATION FILMS FOR PHOTOENGRAVING AND APPARATUS THEREFOR

Samuro Nakamura, Nagoya, Japan, assignor to Nakamura Purosesu Kogei Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 11, 1985, Ser. No. 774,947
Claims priority, application Japan, Sep. 13, 1984, 59-193037; Sep. 17, 1984, 59-195355
Int. Cl.[4] G03B *23/02*
U.S. Cl. 156—64 8 Claims



1. A method of taping color separation films on a transparent base film to be used for making a printing plate for reproduction by photoengraving, comprising the steps of:
inputting to a computer taping orders of the separation films and taping positions on the transparent base film at which the separation films are to be taped on the basis of the X-Y coordinates and setting angle determined from punched holes formed in the transparent base film and crusiform register marks put on the separation films;
arranging the separation films in the order in which they are to be taped on the transparent base film;
positioning in sequence the separation films to be taped on the base film to a predetermined point of origin;
holding in sequence the separation films positioned at the point of origin;
transferring in sequence the separation films to the taping positions previously stored in the computer; and
taping in sequence the separation films on the base film.

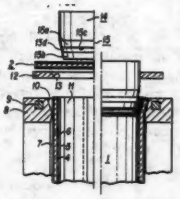
6. An apparatus for taping color separation films on a transparent base film to be used for making a printing plate for reproduction by photoengraving, comprising:
a support frame having an upstanding frame secured to the rearward end thereof;
a film storage mounted on the forward end of said support frame and adapted to store a plurarity of color separation films classified by sizes in the taping order previously inputted to a computer associated with the apparatus;
a film loader disposed rearwardly of said film storage and adapted to take out the separation films one after another from said film storage;
a film centering platform secured to said support frame and adapted to temporarily position the separation film fed from said film loader at a specified location thereon;
a transfer table movably mounted on said support frame for transferring the separation film positioned on said film centering platform, said transfer table including two CCD cameras for detecting the register marks of the separation film as temporarily located on said film centering platform;
a sensing table mounted on said support frame and adjustable for movements in longitudinal, transverse and rotational directions, said sensing table serving to precisely position the temporarily-located separation film fed by said transfer table to a predetermined point of origin;
a base film suction platform mounted on said support frame for releasably holding thereon a running base film on which the separation films are taped;
a taping table mounted on said support frame generally between said sensing table and said base film suction platform and movable in longitudinal, transverse and rotational directions, said taping table serving to releasably grip the separation film set at the point of origin on said sensing table and transfer the same to said base film suction platform, said taping table including a taping device with adhesive tape to tape the separation film on the running base film held on said base film suction platform;
a finished film tray mounted on the upper end of said upstanding frame of said support frame;
a plain base film storage mounted on said support frame generally below said finished film tray for storing a plurality of running base films; and
a base film carrier movably mounted on said support frame for delivering the finished base film from said base film suction platform to said finished film tray and for feeding a new base film from said plain base film storage to said base film suction platform.

4,599,123

METHOD AND APPARATUS FOR MANUFACTURING A CONTAINER HAVING AN INNER END CLOSURE

Od W. Christensson, Järfälla, Sweden, assignor to Esselte PAC Aktiebolag, Sweden

Filed Sep. 2, 1982, Ser. No. 414,056
Int. Cl.[4] B65B *7/00*; B32B *31/00*
U.S. Cl. 156—69 7 Claims



1. A method for manufacturing a can-like container compris-

ing a sleeve formed container jacket and an end closure for at least one end of the jacket, at least one of the container jacket and the end closure being made of a material comprising a base layer of cardboard material or a similar stiff material which does not absorb high frequency current energy and a further layer, located on the base layer, and fabricated of a material which can absorb high frequency current energy and at least one of the common surfaces of the jacket and the at least one end closure of the container to be manufactured comprising a weldable layer of a material which can be welded using high frequency current energy, said method comprising:

making said container jacket out of a planar punched blank which is formed into the container jacket;

placing said container jacket in a jacket carrier which supports the jacket at least adjacent the open end thereof;

making said end closure out of a planar punched blank which is formed into a cup form end closure having a planar bottom and, extending from said bottom, an upwardly and outwardly projecting closure rim extending around the end enclosure, said end closure being formed from said planar punched blank by being pressed through a formation ring to form said end closure into a cup form shape having a planar bottom of a size which is slightly smaller than the internal cross section of the open end of said container jacket;

pressing the end closure down into an open end of the container jacket by means of a press piston to form a common surface between the jacket and the end closure rim;

resiliently compressing a part of the height of the common surface between the jacket and the end closure rim at a location intermediate the extremities of said common surface with greater pressure than the remaining parts, while maintaining the end closure and the jacket axially motionless in relation to each other, by expanding an expandable press ring, having a surface of curved convex shape in cross section for contacting the end closure rim and forming a part of the press piston, when the latter is in the pressed down position thereof so as to press the end closure rim and the corresponding jacket portion into engagement with each other over said part of the height of said common surface;

applying a high frequency current across the common surfaces between the jacket portion and the end closure rim until the at least one weldable layer thereof is melted while maintaining said pressure on said part of the height of the common surface between the jacket and the end closure rim;

cutting off the high frequency current;

allowing the weld to solidify;

and retracting the expandable press ring and moving the press piston out of the closed container end.

4,599,124

HIGH IMPACT RESISTANT LAMINATE SURFACE FOR A BOWLING LANE

Peter B. Kelly, Pasadena, Tex., and Edward R. Heagle, Coshocton, Ohio, assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 95,120, Nov. 16, 1979, Pat. No. 4,337,290. This application Sep. 18, 1980, Ser. No. 188,344

Int. Cl.[4] E04B *2/00*

U.S. Cl. 156—71 **1 Claim**

1. The method of producing a bowling lane having a surface characterized by a falling ball impact resistance of at least 60 inches, a coefficient of friction of about 0.16 and a Taber abrasion resistance of at least about 500 cycles comprising:

laying a plurality of thermosetting resin impregnated glass core sheets between a plurality of thermosetting resin impregnated crepe paper core sheets in an alternating manner beginning with and ending with a crepe paper core sheet;

consolidating said thermosetting resin impregnated core sheets, a resin impregnated decorative fibrous print sheet, and an overlying resin containing protective layer under heat and pressure to produce a unitary decorative plastic laminate sheet; and

securing at least one such plastic laminate sheet to a substrate selected from the group consisting of natural wood, consolidated wood fibers, plywood, flakeboard, chipboard and hardboard to produce the desired bowling lane.

4,599,125

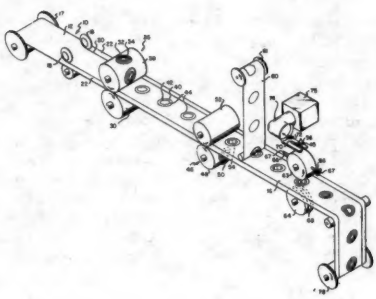
METHOD AND SYSTEM FOR FORMING SHEET MATERIAL INTO APERTURED SHAPES

Byron L. Buck, 7412 Via Lorado, Rancho Palos Verdes, Calif. 90274

Filed Aug. 3, 1984, Ser. No. 637,614

Int. Cl.[4] B32B *31/18*

U.S. Cl. 156—248 **26 Claims**



1. The method of providing adhesively backed apertured elements of a first material and having inner and outer peripheries from a laminate comprising a first sheet material affixed by a detachable adhesive to a backing sheet of second material comprising the steps of:

cutting apertured elements having the inner and outer peripheries desired on a sequential basis into the first material side of the laminate without breaking the backing sheet;

cutting interior peripheral shapes having boundaries within the inner peripheries of the apertured elements through the backing sheet without separating such interior peripheral shapes from the first sheet material;

separating the first sheet material outside the apertured elements from the backing sheet to leave said apertured elements and the material defining the interior shapes of first sheet material within the apertured elements adhering to the backing sheet at the outer edges of the interior portions within the apertured elements; and

separating the interior portions of the apertured elements of first sheet material and the smaller interior peripheral shapes of backing sheet from the laminate while leaving the apertured elements on the backing sheet.

4,599,126

METHOD FOR SEVERING LAMINATES

Dean W. Duffield, South Camden, Australia, assignor to Precision Valve Australia Pty, Limited, New South Wales, Australia

PCT No. PCT/AU82/00144, § 371 Date Apr. 19, 1983, § 102(e) Date Apr. 19, 1983, PCT Pub. No. WO83/00841, PCT Pub. Date Mar. 17, 1983

PCT Filed Aug. 27, 1982, Ser. No. 491,319

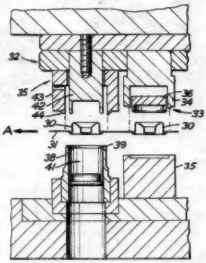
Claims priority, application Australia, Aug. 28, 1981, PF0480

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—268 **9 Claims**

1. A method of severing a laminate of the type including a layer of a metal and a layer of a flexible synthetic plastic mate-

rial, the method comprising forming an indentation of substantially channel-shaped cross section in the laminate along a line on which the laminate is to be severed, the indentation being of such depth as to extend through the full thickness of the plastic



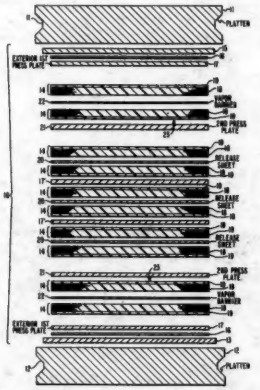
layer and through a part of the thickness of the metal layer contiguous to the plastic material, such that the plastic material along the line of the indentation is substantially displaced laterally; and severing the laminate along the line of the indentation in the metal layer.

4,599,127

PROCESS FOR PRODUCING HIGH GLOSS LAMINATES USING A VAPOR BARRIER AT EACH END OF A LAMINATE ASSEMBLY

Daniel L. Cannady, Jr., Allendale; Halbert Mungin, Varnville, and Gilbert G. Berg, Hampton, all of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 4, 1984, Ser. No. 607,100
Int. Cl.[4] B32B *31/00*
U.S. Cl. 156—289 **6 Claims**



1. A method of molding a laminate assembly, without the use of embossing sheets, in producing high gloss decorative laminates comprising the steps:

(1) placing a laminate assembly between heatable press members in a press, said laminate assembly comprising:

(A) a plurality of press plates, two of which are exterior positioned press plates having a smooth polished finish on at least one side, the rest of which are interior positioned press plates having a smooth polished finish on each side,

(B) at least three laminate stack-up sets, each stack-up set disposed between two press plates, each stack-up set containing two stack-ups, each stack-up comprising a core layer and a decorative layer, with the decorative layer of each stack-up facing the smooth side of the press plates,

(C) a vapor impermeable barrier layer positioned between those stack-ups that are in the stack-up sets disposed next to the two exterior positioned press plates, said barrier layer positioned next to the core layer of each of those stack-ups, and

(D) a release sheet positioned between the stack-ups of the remaining stack-up sets,

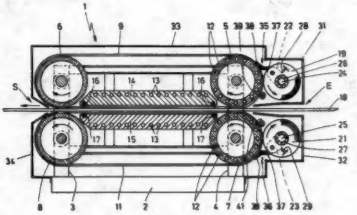
(2) applying heat and pressure to the heatable press members, during which heating, the stack-up sets disposed next to the two exterior press plates will necessarily heat up at a faster rate than the remaining stack-ups in the laminate assembly, generating vapor travel toward the interior of the assembly, where said vapor impermeable barrier layer is effective to prevent excess vapor buildup next to the interior press plate sides facing the exterior press plates, said heat and pressure consolidating the stack-ups to product high glass decorative laminates.

4,599,128

PROCESS AND APPARATUS FOR THE CONTINUOUS PRODUCTION OF METAL-CLAD LAMINATES

Kurt Held, Alte Strasse 1, 7218 Trossingen 2, Fed. Rep. of Germany

Filed Nov. 20, 1984, Ser. No. 673,305
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 3342678
Int. Cl.[4] B32B *31/12*
U.S. Cl. 156—322 **19 Claims**



1. A process for the continuous production of metal-clad laminates, such as a printed circuit boards comprising an electrically insulating layer having opposed main surfaces, and a metal foil applied to at least one of said main surfaces, comprising the steps of preheating the metal foil wound on a supply roll by means of a heatable core in such supply roll; unwinding the preheated foil from such supply roll and bonding such preheated foil to said insulating layer in a dual-belt press by means of heat and pressure.

4,599,129

MACHINE AND METHOD FOR APPLYING MINIATURIZED INDICIA TO ARTICLES

Daniel Kerwin, 588 S. Stewart, Lombard, County of DuPage, Ill. 60148

Filed Sep. 27, 1984, Ser. No. 655,091
Int. Cl.[4] B32B *31/00*; B44C *1/00*; B65H *26/00*
U.S. Cl. 156—361 **15 Claims**

1. Apparatus for transferring indicia from a web to an article, the web including a series of substantially regularly spaced indicia and the article being of any varietal shape, a length of the indicia being substantially less than a length of an exteriorly developed surface of the article, comprising

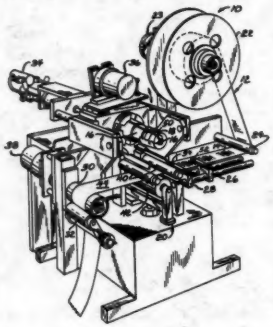
holding means for fixedly supporting the article and adaptable to move the article at a preselected speed,

means to move the web at a speed slower than said preselected speed of the article,

means for causing said web to move into frictional engage-

ment with said article and cause a one of said indicia to be heated to a plastic condition and be permanently transferred from said web to said article,

whereby contact between said indicium and said article is at differing relative speeds and is effective to place said indicium into a plastic condition and assume a greater



length substantially equal to an exterior rectilinearly developed length of the article upon being transferred thereto,

said one of said indicia upon being transferred to said article being changed from a minimal to an optimal preselected size and shape.

4,599,130

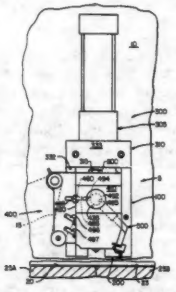
SPLICING TAPE DISPENSER-APPLICATOR

George M. Woodley, Shrewsbury, Mass., assignor to King Instrument Corporation, Westboro, Mass.

Filed Apr. 2, 1985, Ser. No. 718,877

Int. Cl.[4] B31F *5/06;* **B65H** *69/06*

U.S. Cl. 156—497 **13 Claims**



1. A splicing tape dispenser-applicator for sequentially and repeatedly dispensing an adhesive splicing tape from a supply roll thereof, severing a predetermined length of said splicing tape, and applying said severed length of splicing tape to the abutting ends of two tapes to be spliced disposed on a splicing block, said dispenser-applicator comprising:

(a) a base plate;

(b) a pawl assembly mounted to said base plate comprising first and second pawls, said first pawl being adapted to yield in a first direction but not in a second opposite direction, and said second pawl being adapted to yield in said second opposite direction but not in said first direction;

(c) an actuator assembly mounted to said base plate and comprising an actuator having an actuator arm adapted to reciprocate axially; and

(d) a splicing tape applicator assembly mounted to said actuator arm so that said applicator assembly will reciprocate between a first retracted position and a second extended position when said actuator arm reciprocates axially, said applicator assembly comprising:

(1) a mounting member;

(2) splicing tape cutter means mounted to said mounting member comprising a cutter blade and means for reciprocating said cutter blade between a first forward position and a second rearward position;

(3) a mounting bracket mounted to said mounting member;

(4) a rotatable multi-faced applicator wheel for feeding splicing tape from a supply roll and applying a severed length of said splicing tape to the abutting ends of two tapes that are to be spliced;

(5) a rotatable multi-tooth ratchet wheel;

(6) means mounting said applicator wheel and said ratchet wheel to said mounting bracket so that rotational movement of said ratchet wheel will cause corresponding rotational movement of said applicator wheel; and

(7) air passageway means formed in said applicator assembly and arranged so that (a) when said applicator assembly is disposed in its first retracted position, suction is applied to at least a selected face of said applicator wheel that is positioned to next apply a section of splicing tape to the two tapes to be spliced, whereby said suction will hold a severed length of splicing tape to said selected face, and (b) as said applicator assembly is moved to its second extended position, the application of suction to said selected face will be maintained so as to keep said severed length of splicing tape held to said selected face by suction;

said applicator assembly being positioned relative to said pawl assembly so that when said applicator assembly advances from its first retracted position to its second extended position, said ratchet wheel will engage said first pawl and said first pawl will rotatively advance said applicator wheel one half face in a predetermined direction, and when said applicator assembly advances from its second extended position to its first retracted position, said ratchet wheel will engage said second pawl and said second pawl will rotatively advance said applicator wheel one half face in the same predetermined direction, whereby each complete reciprocation cycle of said applicator assembly will rotatively step said applicator wheel forward one complete face.

4,599,131

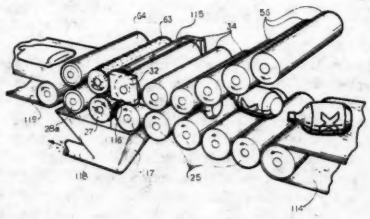
DELABELER FOR PLASTIC CONTAINERS

John J. Matuszak, Rossford, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jun. 10, 1985, Ser. No. 742,687

Int. Cl.[4] B32B *31/22*

U.S. Cl. 156—584 **10 Claims**



1. Apparatus for removing extraneous material from plastic containers for recycling of the plastic, comprising an infeed

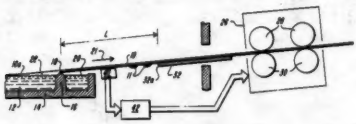
conveyor, a first series of horizontal rolls in line with said conveyor, a second series of horizontal rolls positioned above said first series, means mounting said second series of rolls at progressively less vertical distance from said first series of rolls in a direction away from said infeed conveyor, means for driving said first series of rolls at progressively greater velocities the further the roll is from the infeed conveyor, means connected to said rolls for heating said rolls, a pair of vertically opposed wire brush rolls positioned adjacent the last heated rolls, means for driving said brush rolls at a much lesser peripheral velocity than said heated rolls and in an opposed direction to the movement of a container therebetween, and a pair of opposed, driven pull rolls positioned adjacent said brush rolls, for pulling flattened containers from the brush rolls.

4,599,132

GUIDANCE SYSTEM FOR LOW ANGLE SILICON RIBBON GROWTH

David N. Jewett, Harvard; Herbert E. Bates, Ashby, both of Mass., and Joseph B. Milstein, Denver, Colo., assignors to Energy Materials Corporation, So. Lancaster, Mass.

Filed Jan. 18, 1985, Ser. No. 692,844
Int. Cl.[4] C30B *15/06*
U.S. Cl. 156—617 H **2 Claims**



1. In a method for growing a solidified crystalline ribbon from a growth zone on the surface of a melt held in a crucible where the solidified ribbon is drawn by a puller mechanism in a first direction at a low positive angle from the horizontal over a scraper projecting above the melt to an inclined support plate located between said crucible and said puller mechanism along said first direction and positioned to support said solidified ribbon on its upper surface, the improvement comprising the steps of

controlling the growth rate of said ribbon so that the ribbon has a thickness of less than 0.7 mm,

producing a growth zone with a length in said first direction of at least 5.0 cm to increase the wet loading of the melt at the end of the ribbon leaving the growth zone, and

spacing said support plate from said scraper by at least 15 cm,

whereby variations in the vertical position of the ribbon with respect to the ramp due to irregularities on the lower surface of said ribbon are dissipated through a flexure of said ribbon portion between said scraper and said support plate with substantially no corresponding vertical movements of the ribbon at the growth zone.

4,599,133

METHOD OF PRODUCING SINGLE-CRYSTAL SILICON FILM

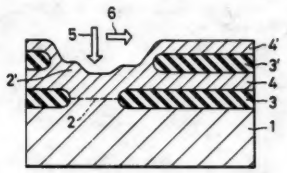
Masanobu Miyao, Tokorozawa; Makoto Ohkura, Hachioji; Iwao Takemoto, Nishitama, and Masao Tamura, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 4, 1983, Ser. No. 491,544
Claims priority, application Japan, May 7, 1982, 57-75260
Int. Cl.[4] C30B *13/24*
U.S. Cl. 156—617 R **17 Claims**

1. A method of producing a single-crystal silicon film comprising the steps of:

(a) forming a plurality of insulator films each having an opening and a plurality of polycrystalline or amorphous silicon films on one major surface of a single-crystal substrate, said insulator films and said silicon films being alternately stacked with at least a portion of a silicon film being in contact with the single-crystal substrate, and

(b) single-crystallizing said polycrystalline or amorphous silicon films by irradiating the plurality of polycrystalline or amorphous silicon films at once with a laser beam or an



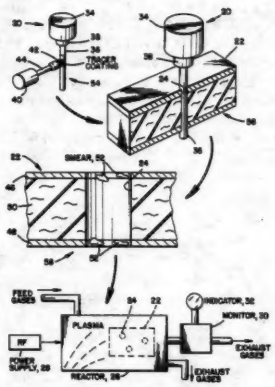
electron beam; the heat generated by the beam being so controlled and the thickness of the insulator films being so selected that the plurality of polycrystalline or amorphous silicon films are simultaneously heated whereby each of the silicon films is single-crystallized.

4,599,134

PLASMA ETCHING WITH TRACER

Suryadevara V. Babu, Potsdam; Joseph G. Hoffarth, and John A. Welsh, both of Binghamton, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Jun. 10, 1985, Ser. No. 743,010
Int. Cl.[4] B44C *1/22*; C03C *15/00, 25/06*; B29C *17/08*
U.S. Cl. 156—626 **12 Claims**



1. A method for shaping a workpiece comprising:

coating a cutting instrument with a tracer;

advancing said instrument toward the workpiece to form a cut therein, said tracer adhering to a surface of said cut;

withdrawing said instrument from said cut;

applying an etchant in the form of a plasma to the workpiece for etching away debris on the surface of the cut, the plasma lifting away the tracer, said applying including a continuous replenishment of fresh plasma;

monitoring the plasma for the presence of a component of the tracer; and

terminating the application of the plasma to the workpiece when the monitoring shows the plasma to be substantially free of the tracer.

4,599,135

THIN FILM DEPOSITION

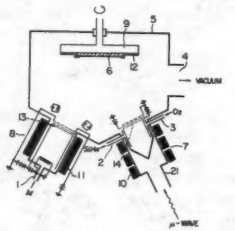
Sukeyoshi Tsunekawa, Tokorozawa; Yoshio Homma, Tokyo; Hiroshi Morisaki, Hachioji; Sadayuki Okudaira, Ome, and Kiichiro Mukai, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 28, 1984, Ser. No. 655,438

Claims priority, application Japan, Sep. 30, 1983, 58-180236; May 2, 1984, 59-87705

Int. Cl.[4] B44C *1/22;* C03C *15/00;* B05D *3/06;* C23C *14/00*

U.S. Cl. 156—643 28 Claims



13. A method of depositing a film on a substrate, comprising the steps of:

(a) forming vapor phase deposition material and vapor phase etching material at independent portions; and

(b) directing said deposition material and said etching material simultaneously or alternately on a substrate, whereby deposition proceeds while deposited material being partly etched away.

4,599,136

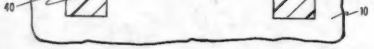
METHOD FOR PREPARATION OF SEMICONDUCTOR STRUCTURES AND DEVICES WHICH UTILIZE POLYMERIC DIELECTRIC MATERIALS

Constance J. Araps, Wappingers Falls; Steven M. Kandetzke, Fishkill; Ellen L. Kutner, Poughquag, and Mark A. Takacs, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 3, 1984, Ser. No. 657,277

Int. Cl.[4] H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*

U.S. Cl. 156—643 19 Claims



13. A method of preparing semiconductor structures which utilize trenches filled with polymeric dielectric materials to isolate segments thereof, comprising:

(a) coating said semiconductor structure and concurrently filling said trenches thereof with a layer of a removable lift-off polymeric underlay;

(b) forming a mask/imaging layer over said polymeric underlay, with said mask layer having a pattern of openings defining a desired conductive pattern;

(c) etching via said mask openings through said polymeric underlay to the surface of said semiconductor structure;

(d) depositing a blanket layer of conductive material over said mask layer and on the exposed surfaces of said semiconductor structure;

(e) [illegible]g said polymeric underlay from said semiconductor [illegible]cture and said trenches;

(f) fill[illegible]g said trenches and concurrently coating said semiconductor structure with a dielectric composition; and

(g) planarizing said dielectric composition to a level even with the surface of said semiconductor structure surrounding said trenches and simultaneously exposing said conductive pattern upon other portions of said semiconductor structure.

15. The method of claim 13 including the additional steps of:

(h) blanket coating said semiconductor structure and the conductive pattern thereon with silicon nitride film;

(i) blanket coating said silicon nitride film with a layer of a silicon dioxide dielectric to a level above said conductive pattern; and

(j) planarizing said silicon dioxide layer and said silicon nitride film by dry etching thereof to a level exposing the top surface portion of said conductive pattern.

4,599,137

METHOD OF FORMING RESIST PATTERN

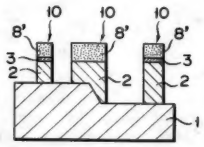
Hideo Akiya, Isehara, Japan, assignor to Nippon Telegraph and Telephone Corp., Tokyo, Japan

Filed Apr. 9, 1985, Ser. No. 721,305

Claims priority, application Japan, Apr. 11, 1984, 59-72253

Int. Cl.[4] B44C *1/22;* C03C *15/00, 25/06;* B29C *17/08*

U.S. Cl. 156—643 11 Claims



1. A method of forming a resist pattern, comprising the steps of:

(a) sequentially forming a plurality of resist films on a substrate, including a highly sensitive resist film having relatively low etching resistance properties, said highly senstive resist film being formed as an uppermost resist layer;

(b) forming an uppermost resist pattern including a desired patterned groove in said uppermost resist layer such that said groove substantially extends through said uppermost resist layer;

(c) forming an etching mask film on an entire exposed surface including a surface of said uppermost resist pattern;

(d) forming a mask pattern, which is complemental to said uppermost resist pattern, by partially removing said etching mask film to leave said etching mask film only in said patterned groove; and

(e) forming a resist pattern by etching a portion of said plurality of resist films excluding a mask region by using said etching mask pattern as a mask.

4,599,138

PROCESS FOR PRETREATING PARTICULATE LIGNOCELLULOSIC MATERIAL TO REMOVE HEAVY METALS

Jonas A. I. Lindahl, Domsjo, Sweden, assignor to Mooch Domsjo Aktiebolag, Ornskoldsvik, Sweden

Continuation-in-part of Ser. No. 98,278, Nov. 28, 1979, abandoned, which is a continuation of Ser. No. 901,935, May 1, 1978, abandoned. This application Oct. 30, 1981, Ser. No. 316,461

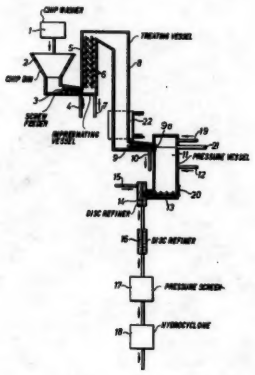
Claims priority, application Sweden, May 2, 1977, 77050730

Int. Cl.[4] D21C *1/04, 3/26*

U.S. Cl. 162—19 19 Claims

1. A process for pretreating particulate lignocellulosic mate-

rial to remove heavy metals and resin without any delignification or defibration, which comprises washing particulate lignocellulosic material; compressing the washed material to a solids content of at least 40% to remove undiluted, absorbed liquid; impregnating the compressed material with an alkaline aqueous solution comprising alkali and at least one member selected from the group consisting of a heavy metal ion complexing agent and a heavy metal ion reducing agent; heating the impregnating material at a temperature within the range from about 50° to 100° C. for from about 0.1 to about 0.75 hour; compressing the pretreated material to a solids content of at least 40%; and separating undiluted liquor squeezed out during the compression; while maintaining conditions during the pretreating such that the pH of the squeezed-out liquor is within the range from about 4 to about 9.5; thereby separating heavy metal ions, resins and alkali-extracted substances in solution in the expressed liquor but no lignin.



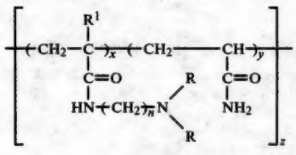
4,599,139

DEWATERING OF WET PAPER WEBS USING MANNICH ACRYLAMIDE POLYMERS

Robert E. Scalfarotto, Montvale, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 26, 1984, Ser. No. 593,053
Int. Cl.⁴ D21H *3/58*
U.S. Cl. 162—168.3 **7 Claims**

1. In a method for the production of paper wherein an aqueous slurry of paper-producing fibers containing from about 0.01 to about 0.3 percent solids, by weight, based on the fiber content of the furnish, of a water-soluble, essentially linear, polymer having the formula:



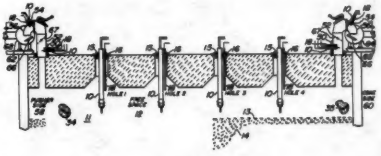
wherein R is an alkyl group of 1–2 carbon atoms, inclusive, R^1 is hydrogen or methyl, n is an integer of 1–6, inclusive, the ratio of x:y range from about 1:3 to about 3:1, respectively, and z is the degree of polymerization, is wet laid to form paper, the improvement wherein z is such that the molecular weight of the polymer is not greater than 300,000 and the pH of the slurry is less than about 5.5.

4,599,140

METHOD AND APPARATUS FOR CONTROLLING CROSSFLOW IN A DOUBLE COLLECTOR MAIN COKE OVEN BATTERY

Edmund G. Bauer, Allentown, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Apr. 23, 1984, Ser. No. 602,882
Int. Cl.⁴ C10B *47/06*
U.S. Cl. 201—1 **13 Claims**



1. A method of controlling the crossflow of gases given off by a coal mass during the production of coke in a coke oven having a coke side collector main and a pusher side collector main comprising the steps of:

(a) determining the temperature difference between the temperature in the coke side standpipe and the temperature in the pusher side standpipe,

(b) determining the temperature difference between the temperature in the freespace adjacent the coke side of the coke oven and the temperature in the freespace adjacent the pusher side of the coke oven,

(c) determining the temperature difference between the temperature of the heating wall of the coke oven adjacent the coke side of the coke oven and the temperature of the heating wall of the coke oven adjacent the pusher side of the coke oven, and

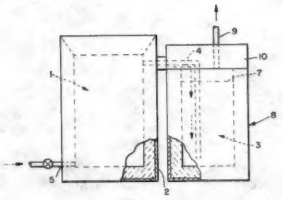
(d) opening the coke side standpipe control valve and gooseneck damper and the pusher side standpipe control valve and gooseneck damper, if they are not in the open position, if the temperature difference of step (b) is substantially the same as the temperature difference of step (c) and the temperature difference of step (a) is greater than about 50° F. in order to control crossflow.

4,599,141

PROCESS FOR THE THERMAL AND CHEMICAL DESTRUCTION OF TOXIC AND INFECTIOUS BIOLOGICAL MATERIALS

Clifford G. Shultz, 1701 Glendale, Evansville, Ind. 47712

Filed Aug. 7, 1984, Ser. No. 638,501
Int. Cl.⁴ C10B *49/14, 57/04*
U.S. Cl. 201—2.5 **5 Claims**



1. A process for the destruction of biological waste products comprising the steps of

(a) heating said waste products in a sealed chamber to vaporize volatiles and to pyrolyze non-volatiles and producing an output stream comprising gas with residual biological matter including physiologically active materials entrained therein, followed by

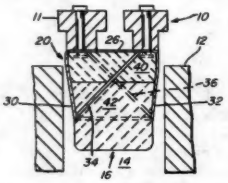
(b) treating said output stream after removal from said sealed chamber by passage into contact with molten aluminum thereby effecting chemical reduction by reaction with aluminum and producing innocuous effluent.

4,599,142

COKE OVEN DOOR LINING

Roger L. Rueckl, Washington Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 3, 1985, Ser. No. 688,468
Int. Cl.[4] C10B 25/04
U.S. Cl. 202—242 10 Claims



1. A coke oven door lining construction in combination with an elongate coke oven door having a door frame, comprising:

(a) at least one elongated, generally "U"-shaped retaining frame affixed to said coke oven door frame and extending substantially the length thereof, said retaining frame comprising a flat base portion and first and second legs extending substantially perpendicular to said base portion and substantially parallel to one another;

(b) at least one first bracing bar affixed at one end thereof to the free end of said first leg and affixed at the other end to said base portion;

(c) at least one second bracing bar affixed at one end thereof to the free end of said second leg and affixed to the other end to said base portion;

(d) a refractory plug supported by said retaining frame and said first and second bracing bars and substantially filling said retaining frame, said refractory plug extending outwardly from said base portion beyond said first and second legs, said refractory plug comprising a castable refractory material.

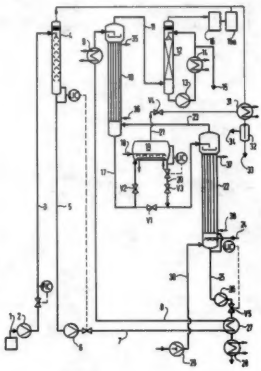
4,599,143

PROCESS FOR DEODORIZING AND/OR PHYSICAL REFINING OF HIGH-BOILING ORGANIC EDIBLE OILS, FATS AND ESTERS

Hermann Stage, Ludgeristrasse 9, 4400 Münster, Fed. Rep. of Germany

Filed Jul. 18, 1983, Ser. No. 514,903
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1982, 3227669
Int. Cl.[4] B01D 1/22; C09F 5/10
U.S. Cl. 203—6 37 Claims

1. A process for removing lower boiling components from at least one liquid member selected from the group of high-boiling, organic, edible oils; high-boiling, organic, edible fats; high-boiling, organic, edible esters; or mixtures thereof; employing continuous countercurrent falling film stripping steam distillation in an externally imposed termperature field, which comprises heating said liquid member to 220° to 280° C., at a working pressure between 2 and 10 mbar, causing said liquid member at 220° to 280° C. and said working pressure to flow down as a thin film having a film thickness of less than 1.0 mm at the wall of substantially vertically arranged surfaces forming trickle passages maintaining at least a part of said passages at a higher termperature than the downflowing liquid, and passing a vapor of a low-molecular weight liquid countercurrently to said liquid through said trickle passages; which comprises providing at least two countercurrent falling film stripping steam distillation zones operating in series and being in vapor and liquid communication with each other and providing an unrestricted vapor flow connection and wherein the hydraulic equivalent diameters of the trickle passages in the final distillation zone downstream in the direction of the downflowing liquid are smaller than the hydraulic equivalent diameters of the trickle passages of the initial zone(s) located upstream of said final distillation zone; and supplying stripping steam exclusively to the bottom of said final distillation zone.



4,599,144

PROCESS FOR RECOVERY OF METHACRYLIC ACID

Marc O. Baleiko, Naperville, and Edward F. Rader, Wheaton, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 25, 1984, Ser. No. 624,049
Int. Cl.[4] B01D 3/36
U.S. Cl. 203—15 14 Claims

1. A process of distilling a reaction product formed by the reaction between a saturated aliphatic monocarboxylic acid compound and a formaldehyde compound and comprising unreacted saturated aliphatic monocarboxylic acid compound, an alpha,beta-ethylenically unsaturated aliphatic monocarboxylic acid compound of one more carbon atom than the starting saturated aliphatic monocarboxylic acid compound, water, unreacted formaldehyde compound and by-products, which comprises fractionally distilling said reaction product whereby a sidestream comprising unreacted saturated aliphatic monocarboxylic acid compound and unreacted formaldehyde compound is removed from the central part of a distillation column, said alpha,beta-ethylenically unsaturated aliphatic monocarboxylic acid and water being removed as bottoms and overhead respectively.

8. A process of distilling a reaction product formed by the reaction between a saturated aliphatic monocarboxylic acid compound and a formaldehyde compound and comprising unreacted saturated aliphatic monocarboxylic acid compound, an alpha,beta-ethylenically unsaturated aliphatic monocarboxylic acid compound of one more carbon atom than the starting saturated aliphatic monocarboxylic acid compound, water, unreacted formaldehyde compound and by-products, which comprises fractionally distilling said reaction product together with a non-reactive compound which entrains water and breaks or prevents the formation of a water azeotrope of said saturated aliphatic monocarboxylic acid compound under conditions whereby (1) a major proportion of said ethylenically unsaturated monocarboxylic acid compound is in the bottom of a distillation column, (2) a major portion of the water, a portion of aid formaldehyde compound and a major portion of said compound capable of breaking or preventing

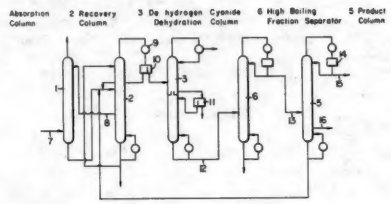
the formation of said azeotrope are removed overhead and (3) a sidestream comprising unreacted saturated aliphatic monocarboxylic acid compound and unreacted formaldehyde compound is removed from the central part of said distillation column.

4,599,145

RECOVERY PROCESS FOR PRODUCING PURIFIED METHACRYLONITRILE

Kiyoshi Kawakami; Hiroyuki Ohashi, and Tsutomu Katsumata, all of Yokohama, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1983, Ser. No. 505,967
Claims priority, application Japan, Jun. 22, 1982, 57-107098
Int. Cl.[4] B01D *3/00*
U.S. Cl. 203—71 **9 Claims**



1. In a process for the recovery of purified methacrylonitrile from a mixture of methacrylonitrile with other olefinic nitriles, said mixture being produced by vapor phase ammoxidation of isobutylene or tert-butyl alcohol with ammonia and oxygen, and wherein said mixture has been absorbed by a water solvent in an absorption column, the process comprising:

(a) feeding the resulting absorbed aqueous solution of said mixture to a recovery column, wherein said solution is extractively distilled with water;

(b) removing as the overhead of said recovery column a vapor stream which is condensed to form a two-phase liquid distillate having an aqueous layer and an organic oil layer;

(c) separating the recovery column overhead organic oil layer from the aqueous layer;

(d) returning the separated aqueous layer to the recovery column;

(e) feeding the separated organic oil layer to a de-hydrogen cyanide/dehydration column;

(f) removing hydrogen cyanide from the overhead of the de-hydrogen cyanide/dehydration column;

(g) removing from the de-hydrogen cyanide/dehydration column, a two-layer, aqueous and organic sidestream;

(h) separating the de-hydrogen cyanide/dehydration column sidestream organic layer from the aqueous layer;

(i) removing crude methacrylonitrile as the bottoms of the de-hydrogen cyanide/dehydration column;

(j) feeding the crude methacrylonitrile to a high-boiling fraction separation column, the improvement comprising:

(k) removing isobutyronitrile from the crude methacrylonitrile by withdrawing as the bottoms of the high-boiling fraction separation column an organic liquid stream of isobutyronitrile and other high-boiling impurities;

(l) removing as the overhead of the high-boiling fraction separation column a vapor stream of methacrylonitrile and other low-boiling components, and condensing said vapor stream to a liquid distillate;

(m) feeding the high-boiling fraction separation column liquid distillate to the lower half of a product column;

(n) removing as the overhead of the product column a vapor stream of methacrolein and other low-boiling components, condensing said vapor to a liquid, and recyling said liquid to the top of the product column;

(o) removing as the bottoms of the product column a liquid stream of residual high-boiling components and recycling said liquid stream to the recovery column, and;

(p) removing purified methacrylonitrile from the lower half of the product column as a vapor sidestream.

2. In a process for the recovery of purified methacrylonitrile from a mixture of methacrylonitrile with other olefinic nitriles, said mixture being produced by vapor phase ammoxidation of isobutylene or tert-butyl alcohol with ammonia and oxygen, wherein said mixture has been absorbed by a water solvent in an absorption column,

and wherein the resulting absorbed aqueous solution of said mixture is fed to a recovery column, where said solution is extractively distilled with water, the improvement comprising:

separating isobutyronitrile from the absorbed aqueous solution and removing isobutyronitrile from the process by:

(1) operating the recovery column such that isobutyronitrile is caused to accumulate in the bottom of said column;

(2) withdrawing the accumulated isobutyronitrile with the water from the bottom of said recovery column as a concentrated aqueous isobutyronitrile solution;

(3) conducting said concentrated aqueous isobutyronitrile solution to the absorption column; and

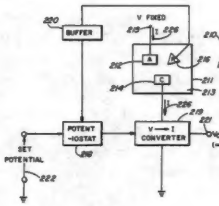
(4) removing the isobutyronitrile from the absorption column overhead.

4,599,146

LONG TERM CURRENT DEMAND CONTROL SYSTEM

George K. Schattschneider, Victoria, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed Nov. 26, 1984, Ser. No. 674,739
Claims priority, application Canada, Dec. 22, 1983, 444172
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—1 T **4 Claims**



1. A method of measuring long term current demand in a metal plate cathode to determine parameters of cathodic protection for said plate, said plate cathode forming part of an electrical circuit in an apparatus, said apparatus having an anode and a reference electrode wherein the anode, reference electrode, and cathode are immersed in an electrolyte, comprising the steps of:

applying a fixed potential to said anode;

measuring a reference potential at said reference electrode; and

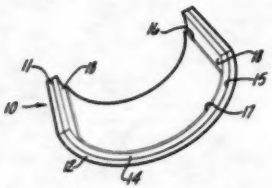
drawing a current directly through the cathode and said anode by means of a potentiostatic control, said potentiostatic control being responsive to an established set potential and said measured reference potential at said reference electrode, wherein the algebraic difference between said set potential and said reference potential causes a variation of said current drawn through said cathode which is indicative of corrosive action affecting said cathode.

4,599,147

METHOD FOR MAKING IMPROVED SPLIT BEARINGS HAVING MASKED RELIEF AREAS

Ronald J. Thompson, Howell, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Jul. 11, 1984, Ser. No. 629,855
Int. Cl.[4] C25D *5/02, 7/10*
U.S. Cl. 204—15 4 Claims



1. A method of making a split journal bearing comprising the steps of:

(a) forming a bi-metal strip into a semi-cylindrical bearing member having a concave bearing surface extending throughout the length thereof to a parting face at each opposed circumferential end of said bearing member;

(b) machining the concave bearing surface to form a bearing body having a predetermined wall thickness;

(c) placing said bearing body in a plating rack;

(d) masking a minor portion of said concave bearing surface at each said end of said bearing member adjacent and contiguous with a respective said parting face in the plating rack to prevent plating said minor portions and;

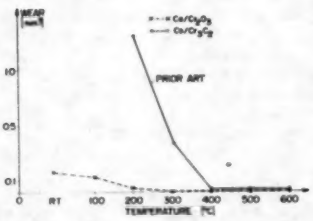
(e) plating the concave bearing surface of the bearing bodies except at said minor portions to form a split journal bearing having a plated concave bearing surface portion and an unplated portion thereof at said ends forming respective crush relief areas of lesser thickness than said plated concave bearing surface portion.

4,599,148

GALVANICALLY DEPOSITED DISPERSION LAYER AND METHOD FOR MAKING SUCH LAYER

Martin Thoma, and Paul Bünger, both of Munich, Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Division of Ser. No. 592,851, Mar. 23, 1984. This application Oct. 18, 1985, Ser. No. 788,755
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1983, 3327346
Int. Cl.[4] C25D *15/00*
U.S. Cl. 204—16 9 Claims



1. A method for producing a galvanically deposited dispersion layer comprising a cobalt matrix and a non-metallic dispersion phase of chromic oxide particles (Cr_2O_3) embedded in said cobalt matrix, comprising the following steps:

(a) preparing an electrolytic bath having a cobalt ion content,

(b) suspending chromic oxide particles in said electrolytic bath,

(c) adjusting the pH-value of the electrolytic bath to be within the range of 4.5 to 4.9,

(d) operating the bath at a temperature within the range of 40° C. to 60° C., and

(e) adjusting the current density to a value within the range of 1 amp/dm^2 to 6 amps/dm^2 for depositing said dispersion layer with the chromic oxide particles embedded in said cobalt matrix on a structural component.

4,599,149

PROCESS FOR ELECTROPLATING TIN, LEAD AND TIN-LEAD ALLOYS AND BATHS THEREFOR

Fred I. Nobel, Sands Point; Barnet Ostrow, Roslyn, and David N. Schram, Freeport, all of N.Y., assignors to LeaRonal, Inc., Freeport, N.Y.

Continuation-in-part of Ser. No. 301,390, Sep. 11, 1981, abandoned. This application Dec. 22, 1983, Ser. No. 564,516
Int. Cl.[4] C25D *3/32, 3/36, 3/56, 3/60*
U.S. Cl. 204—44.4 16 Claims

1. An electroplating bath for the electrodeposition of tin, lead or tin-lead alloys comprising an aqueous solution containing tin and/or lead as soluble alkyl sulfonates, a sufficient amount of a soluble alkyl sulfonic acid or acid salt to impart a pH below about 3 to the bath, a sufficient amount of an alkylene oxide compound which provides a cloud point above about 90° F. to the bath, and a quaternary nitrogen fatty acid wetting agent in a sufficient amount to improve the throwing power of the bath and the surface finish of the electrolytic deposit.

4,599,150

PREPARATION OF ADDUCTS

John B. Mullin, West Malvern; Arthur K. Holliday, Bromborough; David J. Cole-Hamilton, Ormskirk; Anthony C. Jones, St. Helens, and Neil D. Gerrard, Liverpool, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 521,828, Aug. 10, 1983, abandoned. This application Nov. 6, 1984, Ser. No. 668,686
Claims priority, application United Kingdom, Aug. 13, 1982, 8223418; Feb. 24, 1983, 8305166
Int. Cl.[4] C25B *1/00*
U.S. Cl. 204—59 QM 13 Claims

1. A method of a producing compound semiconductor materials comprising producing an adduct of an organometallic compound $M(R^1)_3$, where M is either indium or gallium and R^1 is either methyl or ethyl, and where the adduct is of formula $M(R^1)_3$. L, by the steps of:

(i) electrolysing, using a sacrificial anode of the metal M, a solution containing components 1 and 2 as follows:

component 1: one or more organomagnesium halide compounds R^1MgX where X is a halide radical selected from Cl, Br and I and where R^1 is as defined above;

component 2: a polar aprotic liquid which is a solvent for component 1, which provides the source of the radical L, and which is selected from the group consisting of tetrahydrofuran, diethyl either, di-n-propyl ether, di-n-butyl ether, di-n-pentyl ether, di-isopentyl ether, diphenyl ether, and alkyl phenyl ethers having from 1 to 7 carbon atoms in the alkyl group; and

(ii) converting the adduct $M(R^1)_3$. L formed by the electrolysis into a further product from which a semiconductor compound may be obtained.

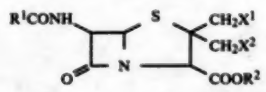
4,599,151

PROCESS FOR PREPARING 2,2-BISHALOMETHYLPENAM DERIVATIVES

Sigeru Torii; Hideo Tanaka, both of Okayama; Michio Sasaoka, Tokushima; Takashi Shiroi, Tokushima, and Seiryu Uto, Tokushima, all of Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

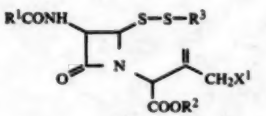
Filed Mar. 15, 1985, Ser. No. 711,922
Claims priority, application Japan, Mar. 27, 1984, 59-60166
Int. Cl.[4] C25B 3/06
U.S. Cl. 204—59 R 10 Claims

1. A process for preparing a 2,2-bishalomethylpenam derivative represented by the formula



(I)

wherein R^1 represents a lower alkyl group, aryl group, arylmethyl group, arylcarbonyl group or aryloxymethyl group, R^2 represents a carboxyl-protecting group, X^1 and X^2 are the same or different and represent a halogen atom, the process being characterized in that a disulfide represented by the formula



(II)

wherein R^1, R^2 and X^1 are as defined above and R^3 represents an aryl group or heterocyclic group is subjected to an electrolytic reaction in a solvent in the presence of a halogen acid and/or halogen salt.

4,599,152

PURE AMINO ACID CHELATES

Harvey H. Ashmead, Kaysville, Utah, assignor to Albion Laboratories, Clearfield, Utah

Filed May 24, 1985, Ser. No. 738,065
Int. Cl.[4] C25B 1/02
U.S. Cl. 204—72 8 Claims

3. A method of preparing an amino acid chelate essentially free of anion radicals other than hydroxyl and anions of weak organic acids which comprises the steps consisting of:

(a) providing an electrolytic cell having anode and cathode compartments divided by a cation permselective membrane wherein the anode is made up of a substantially pure form of the metal or metals to be used in preparing the chelate,

(b) placing an aqueous solution of an amino acid ligand in the anode compartment and electrolyte aqueous solution in the cathode compartment,

(c) applying a direct current across said cell causing the anode metal to dissolve into said aqeuous amino acid ligand solution and react with said amino acid ligand to form an amino acid chelate and wherein hydrogen ions are caused to migrate from said anode solution across said membrane into said cathode compartment where hydrogen gas is released at said cathode, and

(d) recovering said amino acid chelate in substantially pure form from said anode solution.

4,599,153

SELECTIVE EXTRACTION OF RHENIUM FROM AQUEOUS SULFURIC ACID SOLUTIONS

John H. Bright, Kendall Park, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jan. 13, 1983, Ser. No. 457,784
Int. Cl.[4] C25C 1/00; C01G 47/00
U.S. Cl. 204—105 R 11 Claims

1. A process for the selective extraction of rhenium from aqueous sulfuric acid solutions having a pH in the range of from about −0.5 to about 3.0, said process consisting essentially of:

(1) contacting said aqueous sulfuric acid solution with a tertiary phospline oxide extractant compound having the structure:

wherein R^1, R^2 and R^3 are each, independently, selected from the group consisting of alkyl of 6 to 20 carbon atoms, cycloalkyl, aryl, aralkyl, alkyl-substituted aryl and alkyl-substituted arallyl;

(2) separating the resulting phosphine oxide-rhenium complex from said aqueous solution; and

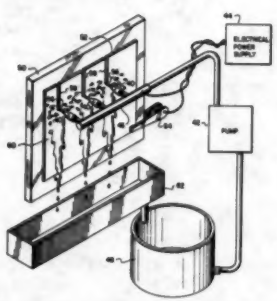
(3) recovering the rhenium from said complex.

4,599,154

ELECTRICALLY ENHANCED LIQUID JET PROCESSING

David L. Bender, Thousand Oaks, and Kim W. Mitchell, Granada Hills, both of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 15, 1985, Ser. No. 712,299
Int. Cl.[4] C25F 3/04, 3/14
U.S. Cl. 204—129.6 5 Claims



1. A method of scribing a thin film of aluminum deposited on a substrate to form part of a thin film solar cell comprising:

contacting the thin film of aluminum along a desired scribe line with a jet of etching solution having a diameter of about 0.002 to about 0.008 inch while passing an electric current of about 0.020 to about 0.100 ampere through a circuit including said jet and said thin film, said etching solution comprising about 5 percent nitric acid in water.

4,599,155

RESIN COMPOSITION

Shuichi Suzuki, Yokohama; Moriyasu Wada, Ninomiya, and Shuzi Hayase, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 21, 1984, Ser. No. 653,089
Claims priority, application Japan, Sep. 22, 1983, 58-174162
Int. Cl.[4] C08F *2/46*
U.S. Cl. 522—8 **22 Claims**

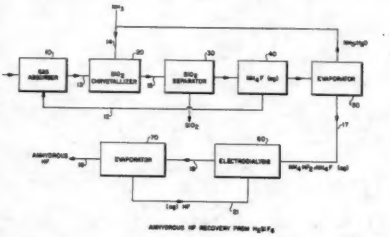
1. A resin composition which comprises
(A) a spiro ortho ester compound and/or a spiro ortho carbonate compound;
(B) an aluminum compound; and
(C) a silanol compound or a silicon compound which is capable of generating a silanol group;
the amounts of components (B) and (C) being within the range of 0.001 to 10% by weight and 0.1 to 20% by weight, based on the amount of component (A), respectively.

4,599,156

ELECTRODIALYSIS PROCESS FOR PREPARING HYDROGEN FLUORIDE

Viswanathan Srinivasan, and Carl O. Quicksall, both of Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Sep. 27, 1985, Ser. No. 781,016
Int. Cl.[4] B01D *13/02*
U.S. Cl. 204—182.4 **8 Claims**



1. A process for producing hydrogen fluoride using an electrodialysis cell having an anode compartment with an anode immersed in an anolyte and a cathode compartment with a cathode immersed in a catholyte separated from one another by an inner electrodialysis compartment, said inner elctrodialysis compartment bounded by two spaced cation exchange membranes, said process comprising electrodialyzing under the influence of an applied current, an alkali metal fluoride solution or an ammonium fluoride solution fed to said inner electrodialysis compartment so that alkali metal ions or ammonium ions are caused to flow through one of said cation exchange membrane into said catholyte and hydrogen ions are caused to flow through the other cation exchange memebrane into said inner electrodialysis compartment thus forming hydrofluoric acid in said inner electrodialysis compartment.

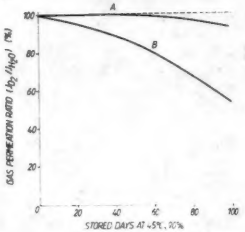
4,599,157

OXYGEN PERMEABLE MEMBRANE

Nobukazu Suzuki, Tokyo, and Shinji Tsuruta, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Feb. 25, 1985, Ser. No. 705,015
Claims priority, application Japan, Feb. 24, 1984, 59-33589; Feb. 24, 1984, 59-33593
Int. Cl.[4] C23C *14/00*
U.S. Cl. 204—192 SP **10 Claims**

1. A composite membrane, said membrane comprising:
a porous membrane having micropores; and
a thin layer affixed to at least one surface of said porous membrane, said thin layer contains a metallic oxide in a carbon matrix; wherein said porous membrane and said thin layer cooperatively permit the passage of oxygen gas therethrough while substantially preventing the passage of water vapor therethrough, said metallic oxide being selected from among the group consisting of tin dioxide, zinc oxide, aluminum oxide, magnesium oxide, calcium



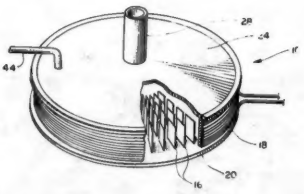
oxide, strontium oxide, barium oxide, titanium dioxide, silicon dioxide, cuprous oxide, manganese monoxide, nickel oxide, tricobalt tetroxide, vanadium dioxide, molybdenum dioxide, tungsten dioxide, ruthenium dioxide, niobium dioxide, chromium dioxide, rhenium dioxide, osmium dioxide, rhodium dioxide, iridium dioxide and platinum dioxide.

4,599,158

CIRCULAR COIL ELECTROLYSIS APPARATUS

Bernard G. F. Ofenloch, 14101 Doty Ave. #19, Hawthorne, Calif. 90250-9998

Filed Mar. 29, 1985, Ser. No. 717,833
Int. Cl.[4] C25B *15/08, 9/00*
U.S. Cl. 204—228 **11 Claims**



1. An electrolysis apparatus for the production of gases from an electrolytic type fluid comprising, in combination:
electrode plates arranged in a circular fan-type array at varying distances from the center of the apparatus such that the plane of each electrode plate is perpendicular to the plane of an imaginary circular disk centered on the axis of symmetry of the array;
a containing means for housing the electrode plate array;
a coil of wire is placed about the periphery of said containing means or the electrode plate array.

4,599,159

ELECTROLYTIC POOL CHLORINATOR HAVING DISTRIBUTION CHAMBER FOR FILLING ANODE AND CATHODE CHAMBERS

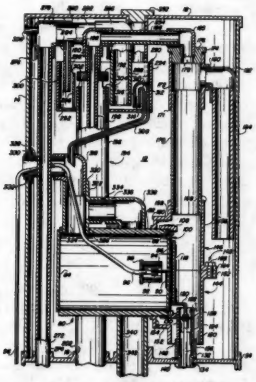
Herbert H. Hilbig, 3125 W. Paradise Dr., Phoenix, Ariz. 85029

Filed May 28, 1985, Ser. No. 738,696
Int. Cl.[4] C25B *1/26, 1/34*
U.S. Cl. 204—266 **18 Claims**

1. An electrolytic pool chlorinator for chlorinating a pool of water, said pool of water including a filter and a pump for

circulating pool water between the pool and the filter, said electrolytic pool chlorinator comprising in combination:

a. an anode chamber for containing a quantity of salt and water to form a brine solution;
b. an anode disposed within said anode chamber;
c. a cathode chamber for containing a catholyte including sodium hydroxide;
d. a cathode disposed within said cathode chamber;
e. an ion permeable selective membrane dividing said cathode chamber from said anode chamber and allowing sodium ions to pass through said membrane from said anode chamber to said cathode chamber while substantially preventing hydroxyl ions within said cathode chamber from passing through said membrane to said anode chamber;
f. an electrical power supply coupled to said anode and to said cathode for imposing a direct current electrical potential thereacross and for liberating chlorine gas at said anode and hydrogen gas at said cathode;
g. collection means for collecting chlorine gas liberated in said anode chamber and intermixing the chlorine gas with pool water for chlorinating the pool water;
h. inlet means in fluid communication with the pump for receiving a stream of pool water under pressure from the pool; and



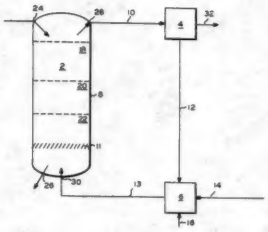
i. distribution means coupled to said inlet means and receiving said stream of pool water, said distribution means serving to continously add pool water to said anode chamber whenever the brine solution contained therein falls below a predetermined fluid level, said distribution means further serving to continuously add pool water to said cathode chamber for maintaining a predetermined level of catholyte therein and for continuously diluting the concentration of sodium hydroxide within said catholyte, said distribution means being disposed at an upper end of said anode chamber and including a first compartment for continuously receiving pool water, said first compartment having a hole therein at a first predetermined height through which hole pool water passes into said anode chamber, said distribution means including a second compartment contiguous with said first compartment and sharing at least one common wall therewith, said common wall extending above said first predetermined height to a second predetermined height and allowing pool water within said first compartment reaching said second predetermined height to spill over said common wall into said second compartment, said distribution means further including conduit means in fluid communication with said second compartment for conveying pool water therefrom to said cathode chamber.

4,599,160

SULFUR DISPOSAL

Bruce W. Gerhold, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 14, 1985, Ser. No. 702,096
Int. Cl.[4] C10G *1/00*; C01B *17/16*
U.S. Cl. 48—210 **8 Claims**



1. In a process for recovering fuel values containing hydrogen sulfide by-product from the pyrolysis of a normally solid mineral with the production of solid, spent mineral product, which is reactable with gaseous oxides of sulfur to form sulfur-containing solids, the improvement comprising:

separating a hydrogen sulfide gas stream from the fuel values;

combusting the hydrogen sulfide gas stream with an oxygen-containing gas stream to form an off-gas stream containing oxides of sulfur; and

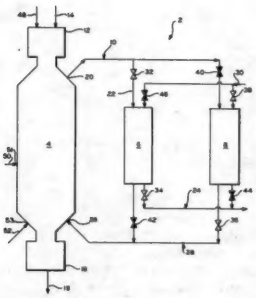
reacting the thus produced off-gas stream containing oxides of sulfur with the solid, spent mineral product from pyrolysis to form a sulfur-containing solid by-product stream.

4,599,161

RETORTING PROCESS WITH CONTAMINANT REMOVAL

James Scinta, and Arlo J. Moffat, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 30, 1984, Ser. No. 678,921
Int. Cl.[4] C10G *1/00*; C01B *17/02*
U.S. Cl. 201—16 **7 Claims**



1. A process comprising:

(a) pyrolizing an oil shale under conditions to form a spent shale stream containing at least one component reactable with sulfur dioxide and an effluent gas stream containing hydrogen, hydrogen sulfide, hydrocarbons, organic sulfur compounds and organic nitrogen compounds;

(b) passing the effluent gas stream through an absorbent bed;

(c) absorbing said hydrogen sulfide from said effluent gas stream in the absorbent bed;

(d) regenerating the absorbent bed with an oxygen-contain-

ing gas stream to form an off-gas stream containing sulfur dioxide; and

(e) passing the off-gas stream into contact with the spent shale stream for reaction of the sulfur dioxide in the off-gas stream with the at least one component in the spent shale stream reactable with sulfur dioxide and the formation of sulfur-containing reaction products.

4,599,162

CASCADE HYDRODEWAXING PROCESS

Jeffrey H. Yen, Swedesboro, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 21, 1984, Ser. No. 684,992
Int. Cl.[4] C10G *65/10*
U.S. Cl. 208—59 **7 Claims**

1. A cascade catalytic hydrodewaxing process comprising:

(a) passing a hydrocarbon feedstock containing waxy components selected from a group of normal paraffins and slightly branched chain paraffins over a hydroisomerization catalyst comprising a crystalline silicate zeolite having the structure of ZSM-12 in admixture with a crystalline silicate zeolite having the structure of ZSM-23, said admixture having hydrogenation/dehydrogenation activity to hydroisomerize the feedstock; and

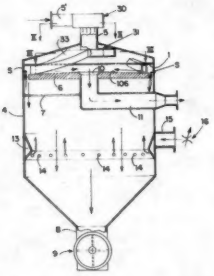
(b) passing at least a majority of the normally liquid hydrocarbon recovered from step (a) over a dewaxing catalyst comprising a crystalline silicate zeolite having a structure of ZSM-5, said zeolite of step (b) having hydrogenation/-dehydrogenation activity to dewax the recovered hydrocarbon.

4,599,163

DEVICE FOR THE SEPARATION OF THE COMPONENTS OF EDIBLE MEAL

Umberto Manola, Brescia, Italy, assignor to The Proteins Technology S.p.A., Campobasso, Italy

Filed May 22, 1984, Ser. No. 612,829
Claims priority, application Italy, Jun. 3, 1983, 12539 A/83
Int. Cl.[4] B07B *11/06*
U.S. Cl. 209—139 A **5 Claims**



1. A separator device for separating the components of edible meal, comprising

(a) a cylindrical container (**4**) of round cross section, having at its bottom a discharge duct (**8**);

(b) a round horizontal disc (**6**) within said container having a peripheral edge of a predetermined thickness and having a conical downwardly diverging upper surface, said disc (**6**) being provided with a central opening (**10**) connected to a duct (**11**) which extends sealingly outwards through said container (**4**) and is connected to a suction source said disk peripheral edge and said container defining therebetween a first vertical separation region;

(c) a distributor comprising a cylindrical casing (**31**) arranged co-axially at the top of said container (**4**), said casing (**31**) being provided at its top with a central opening through which said meal components are fed, and being provided on its cylindrical side wall with substantially equal and equi-spaced openings (**32**) from which project identical and equi-spaced tubes (**33**) curved like the initial portion of an Archimedean spiral and all extending in the same direction, free ends of said tubes upon said disk so as to discharge the meal tangentially onto a peripheral zone of said disc (**6**);

(d) swirling means (**30**) in a feeding duct (**5, 5'**) for said meal, whereby said meal is fed to the casing (**31**) of said distributor with a swirling flow;

(e) a horizontal partition (**1**) arranged above said disc (**6**) and secured to an inner side wall of said container (**4**), said partition (**1**) being traversed in airtight manner by said tubes (**33**) projecting from said feeding distributor (**31**), the undersurface of said partition (**1**) being in contact with the free ends of said tubes (**33**) above said disk periphery so as to form a second horizontal separation zone; and

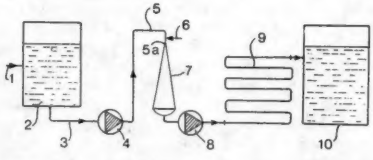
(f) an annular manifold (**13**) located below said disc (**6**) and coaxial therewith, and connected to at least one duct (**15**) opening to the atmosphere through the intermediary of a valve means (**16**), whereby, as a result of the suction exerted in said cylindrical container (**4**) by said suction source, an upward air stream is formed therein which laps the peripheral portion of said disc (**6**) onto which said meal is discharged and permits heavier particles of said meal to precipitate while it holds lighter particles thereof suspended to be entrained by the suction air stream, whereby, due to said distributor chamber (**31**) to which said meal is fed with a swirling flow, and to said tubes (**33**) projecting from said chamber (**31**), said meal is distributed uniformly onto the periphery of said disc (**6**) where it undergoes a first effective separation in said second separation zone by action of said air stream which is sucked through said central opening (**10**) of said disc (**6**) and thus entrains the lighter particles, while the heavier particles continue their centrifugal motion and go beyond the disc where they are subjected to a further separation in said first separation zone by the action of said upward air stream.

4,599,164

PROCESS FOR PRE-CONCENTRATION TREATMENT OF FOOD BY-PRODUCTS AND INSTALLATION FOR CARRYING OUT SAME

Jean-Michel Charles, Bihorel, and Jean-Paul Roulland, Rouen, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Aug. 22, 1983, Ser. No. 525,617
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—86 **2 Claims**



1. An installation for carrying out a preconcentration treatment of liquid food by-product by reverse osmosis, comprising a system for supplying the liquid food by-product to be treated, a buffer tank for holding the liquid by-product from said supplying system, a low-moderate pressure force pump downstream from the buffer tank, a high pressure force pump downstream from the low-moderate pressure force pump, a first pipe between the low-moderate pressure pump and the high pressure pump, reverse

osmosis filters downstream from the low-moderate pressure force pump, and a storage tank for filtered medium downstream from said reverse osmosis filters, said installation further comprising

means for feeding gaseous carbon dioxide to the liquid food by-product to temporarily lower the pH thereof, including a conical device located between said first pipe and said high pressure pump, and gas injecting means for forming a gas-liquid emulsion at the top of the conical device, said gas injecting means including a second pipe connected to the first pipe for supplying carbon dioxide gas to the first pipe

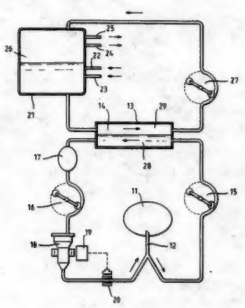
means connected to said first pipe near the small end of a conical device for feeding gaseous carbon dioxide to the liquid food by-product to temporarily lower the pH thereof, said first pipe having an abrupt narrowing near said small end, said conical device being located between said first pipe and said high pressure pump, said gas feeding means including a second pipe connected to the first pipe for supplying carbon dioxide gas to said first pipe upstream of said abrupt narrowing.

4,599,165

SINGLE-NEEDLE ARTIFICIAL KIDNEY

Jacques Chevallet, Serezin du Rhone, France, assignor to Hospal Industrie, Meyzieu, France

Filed Jan. 14, 1985, Ser. No. 691,492
Claims priority, application France, Jan. 18, 1984, 84 00932
Int. Cl.[4] A61M *5/00, 7/00;* **B01D** *13/00*
U.S. Cl. 210—87 **9 Claims**



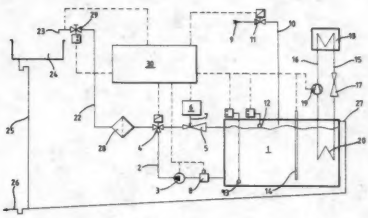
1. An artificial kidney which includes a haemodialyser (13) a semi-permeable membrane (14) which can effect dialysis and ultrafiltration of the blood, said diaphragm dividing said haemodialyser into first and second compartments (28), (29) an extracorporeal blood circuit including said first compartment (28), a blood circulation pump (15, 16) and a single needle (12) for insertion into the patient (11), a dialysis liquid circuit including said second compartment (29) and a dialysis liquid pump (27), characterized in that said dialysis liquid circuit includes means for enabling simultaneous pulsing of both blood and dialysis liquid in the haemodialyser of said single-needle artificial kidney, sufficient to provide the high efficiencies otherwise obtained with conventional double-needle artificial kidneys, including means (*27a, 27b,27c,27d,27e*) for periodically modulating the flow rate of said dialysis liquid in the said haemodialyser (13) between minimum and maximum values, a sensor (17) sensitive to the pulsation of the blood in said extracorporeal blood circuit at a frequency below 1 hertz, and a servo-control (*28a,28b, 28c,28d*) operable in response to said sensor to control said means for periodically modulating the flow of dialysis liquid as a function of said pulsations of the blood at frequencies below 1 hertz.

4,599,166

OZONE DRINKING WATER PURIFICATION APPARATUS

Rudolf Gesslauer, Waldstr. 6, D-3501 Schauenburg, Fed. Rep. of Germany

Filed May 18, 1984, Ser. No. 611,881
Int. Cl.[4] C02F *1/78*
U.S. Cl. 210—96.1 **13 Claims**



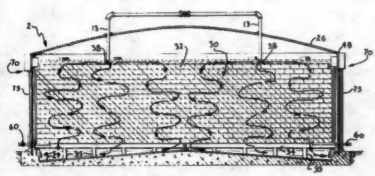
1. An ozone drinking water cooling and purification apparatus constructed as a pre-manufactured household appliance and comprising: a supply system including a tank for storing water, cooling means for cooling said water within said tank, a measuring device for monitoring the redox potential of said water at a preselected location of said supply system, an ozone generator, an ozone injector coupled with said ozone generator to inject ozone into said water at another preselected location of said supply system for purification of said water and for increasing the redox potential thereof up to a preselected drinking water redox potential whenever said measuring device signals that the water redox potential is below said preselected water redox potential, faucet means for taking water from said tank, and automatic preventing means connected to said redox potential measuring device and controlled therby for preventing water not having at least said preselected drinking water redox potential from being taken from said tank via said faucet means.

4,599,167

APPARATUS FOR TREATMENT OF WASTE WATER

Henry H. Benjes, Overland Park; Valery N. Wahbeh, Leawood, and John R. Stukenberg, Overland, Park, all of Kans., assignors to Bacardi Corporation, San Juan, P.R.

Continuation of Ser. No. 510,420, Jul. 1, 1983, abandoned, which is a continuation of Ser. No. 347,665, Feb. 10, 1982, abandoned, which is a continuation of Ser. No. 187,470, Sep. 15, 1980, abandoned. This application Dec. 20, 1984, Ser. No. 684,965
The portion of the term of this patent subsequent to Jan. 19, 1999, has been disclaimed.
Int. Cl.[4] C02F *3/10*
U.S. Cl. 210—150 **13 Claims**



13. An apparatus for reducing oxygen demand of a fluid flowing therethrough by activity of microorganisms producing methane from the fluid including:

(a) a substantially airtight vessel having an inlet for adding additional fluid to be treated in an upper portion of said vessel and an outlet drawing treated fluid from a lower portion of said vessel such that fluid flows generally

downward through said vessel; said vessel having multiple flow interconnected and vertically extending regions such that fluid flowing down through said vessel can freely flow between said vessel interconnected regions over a substantial height of said vessel;

(b) porous structural media within said vessel adapted for supporting growth of the microorganisms thereon and allowing flow of fluid therethrough;

(c) a plurality of recirculation devices each having an associated spaced intake and each withdrawing waste water from near a bottom of a respective one of said vessel interconnected regions so as to selectively allow recirculation of varying amounts of the fluid from said interconnected regions of said vessel to an upper portion of said vessel whereby fluid flow rate down through said vessel between various of said interconnected regions can be varied;

(d) collection means for collecting the methane; and

(e) distribution means substantially uniformly positioned beneath said structural media and adapted to distribute said methane in said vessel lower portion beneath said structural media so as to agitate biomass formed by the microorganisms and to thereby improve interaction of the biomass with the fluid.

4,599,168

APPARATUS FOR TREATMENT OF WASTE WATER HAVING SELECTIVE RECYCLE CONTROL

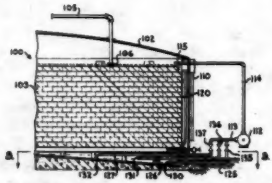
Henry H. Benjes, Overland Park; Valery N. Wahbeh, Leawood, and John R. Stukenberg, Overland Park, all of Kans., assignors to Bacardi Corporation, San Juan, P.R.

Continuation of Ser. No. 510,361, Jul. 1, 1983, abandoned, which is a continuation-in-part of Ser. No. 347,665, Feb. 10, 1982, abandoned, which is a continuation of Ser. No. 187,470, Sep. 15, 1980, abandoned. This application Dec. 20, 1984, Ser. No. 685,201

The portion of the term of this patent subsequent to Jan. 19, 1999, has been disclaimed.

Int. Cl.[4] C02F *3/10*

U.S. Cl. 210—151 **10 Claims**



9. An apparatus for reducing oxygen demand of a fluid flowing therethrough by activity of microorganisms producing methane from matter in the fluid including:

(a) a substantially airtight digester having an inlet for adding additonal fluid near a top of the digester and an outlet for drawing fluid with reduced oxygen demand from near a bottom of the digester such that fluid flows generally downward through said digester; said digester having a plurality of flow interconnected regions such that fluid may freely flow therebetween over substantially the entire height of said digester between said interconnected regions as fluid flows downwardly through said digester;

(b) porous structural media within said digester adapted for supporting growth of the microorganisms thereon and allowing flow of the fluid therethrough;

(c) a plurality of controllable flow recirculation devices; one of said recirculating devices having an intake located near a bottom of a respective one of said vessel interconnected regions; each of said intakes being spaced from one another; said recirculation devices having outlet means located near the top of said digester, whereby flow through various interconnected regions of said digester may be selectively controlled;

(d) collection means for collecting the methane from an upper portion of said digester;

(e) distribution means substantially uniformly positioned beneath said structural media and adapted to distribute said methane in said digester lower portion beneath said structural media;

(f) a desulfurizer; and

(g) a recirculation system including means to selectively recirculate methane from said collection means through said desulfurizer and thereafter return the methane to said distribution means for redistribution within the fluid in said digester.

4,599,169

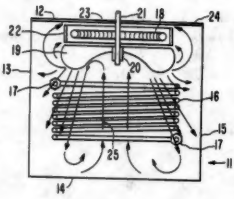
HEATING AND COOLING APPARATUS FOR CHROMATOGRAPHY COLUMN

Curtis Ray, Benicia, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Feb. 28, 1984, Ser. No. 584,421

Int. Cl.[4] G01D *15/08*

U.S. Cl. 210—175 **30 Claims**



1. An oven for heating chromatography columns mounted therein and for enabling the columns mounted in the oven to be cooled relatively quickly comprising an oven enclosure having a wall, the oven having an interior in which is located: mounting means for the columns, a fan assembly having a shaft carrying blades centrally mounted with respect to the wall, the shaft extending through the wall geometric center and connected to be driven by a motor outside of the enclosure, a heater located coaxially with the shaft between the wall and the blades, a baffle surrounding the heater located coaxial with the shaft between the exterior wall and blades, the baffle, heater and blades being configured and located in the enclosure so that the fan functions as a mixture circumferential and axial fan whereby air directed by the blades is incident on the columns without first being intercepted by walls of the oven and the circumferentially directed air is substantially prevented by the baffle from directly reaching the heater, whereby the small number and mass of items in the enclosure causes the enclosure to have a relatively low thermal mass; and selectively opened and closed air inlet and outlet means on the wall, the inlet and outlet means being located so that when the inlet and outlet means are open, air at approximately ambient temperature and pressure is drawn by the blades through the inlet means and the baffle into the enclosure to cool the columns and air drawn into the enclosure by the blades through the inlet means does not flow directly to the outlet means.

4,599,170

FILTRATION APPARATUS

Denis R. Friedman, 21 Arborwood Rd., Acton, Mass. 01720, and Richard C. Goulston, Depot Rd., Harvard, Mass. 01451

Filed Jan. 22, 1985, Ser. No. 693,514

Int. Cl.[4] B01D *35/06*

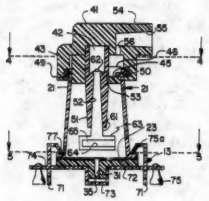
U.S. Cl. 210—223 **22 Claims**

1. A filter apparatus comprising:

a unitary cell for receiving a fluid to be filtered and comprising a receptacle portion with an open end; a base portion

defining an outlet and inseparably bonded to and permanently closing an opposite end of said receptacle portion; and a filter membrane portion disposed between said open end and said outlet, said membrane portion being supported by said base portion and bonded between said base and receptable portions;

cover means removably engagable with said receptacle portion to close said open end;



seal means disposed between said cover means and said receptacle portion,

latch means for producing a hermetic seal between said cover means, said receptacle portion and said seal means;

inlet means providing for said receptacle portion an inlet for pressurized fluid; and

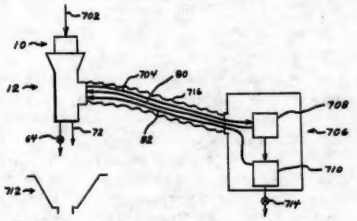
stirrer means disposed within said receptacle portion and activatable to stir the fluid content thereof.

4,599,171

WATER PURIFIER FITTING AND SYSTEM

James M. Padilla, Covina, and Sigfrid A. Tomchak, Fountain Valley, both of Calif., assignors to Pure Water International, Inc., Pomona, Calif.

Filed Jul. 30, 1984, Ser. No. 635,398
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—257.2 **20 Claims**



7. A water purification system comprising:

a quick-disconnect female coupling component;

a corresponding male coupling component having a bore and being adaptable for quick-disconnecting from said female coupling component and adaptable to be attached to a tap water faucet;

a water purifier comprising a reverse osmosis water purification module and a storage tank connected thereto for storing purified water from said module;

tubing assembly consisting of an outer flexible conduit for bundling three pieces of tubing connecting said female coupling component to said water purifier, wherein said three pieces of tubing consist of tap water tubing, concentrate tubing and overflow tubing; and

means for controlling the discharge flow of concentrate into a sink;

wherein said water purification module has an inlet for receiving tap water thereto, and an outlet for discharging a concentrate therefrom, and wherein said storage tank has an outlet for discharging excess purified water therefrom and a tap for discharging purified water therefrom;

wherein said quick-disconnect female coupling component has a tap water inlet port which when coupled to said corresponding male coupling component is in communication with the bore thereof, a concentrate inlet port which is not in communication with said tap water port, an overflow inlet port which is not in communication with said tap water inlet port or said concentrate inlet port, a tap water outlet port which is in communication with said tap water inlet port, a concentrate outlet port which is in communication with said concentration inlet port, an overflow outlet port which is in communication with said overflow inlet port, and a section comprising said tap water outlet port, said concentrate inlet port and said overflow inlet port; and

means for simultaneously fastening one end of said piece of tap water tubing to said tap water outlet port, one end of said piece of concentrate tubing to said concentrate inlet port, and one end of said piece of overflow tubing to said overflow inlet port;

wherein the other end of said piece of tap water tubing is connected to said water purification module inlet for receiving tap water, the other end of said piece of concentrate tubing is connected to said water purification module outlet for discharging concentrate therefrom, and the other end of said piece of overflow tubing is connected to said storage tank outlet for discharging excess purified water;

wherein said first mentioned means is attached to said concentrate outlet port of said female coupling component;

wherein, when said system is in use, tap water flows from a faucet through said male and female coupling components, thence through said tap water tubing into said water purification module wherein a portion of said water is purified and stored in said storage tank until used, wherein the remaining portion of said water is concentrated and discharged from said water purification module into said concentrate tubing, thence into said concentrate inlet port of said female coupling component, thence into said first mentioned means and thence into a sink, and wherein excess purified water is discharged from said storage tank into said overflow tubing, thence into said overflow inlet port of said female coupling component and thence discharged from said overflow outlet port into said sink;

wherein the air space between said first mentioned means and said sink prevents backup of impure water into said water purifier through said concentrate tubing, and the air space between said overflow outlet port and said sink prevents backup of impure water into said storage tank through said overflow tubing.

4,599,172

FLOW LINE FILTER APPARATUS

Robert A. Gardes, 229 Smith Reed Rd., Lafayette, La. 70507

Filed Dec. 24, 1984, Ser. No. 686,072
Int. Cl.[4] B01D *23/02*
U.S. Cl. 210—314 **8 Claims**

1. An apparatus for filtering drilling mud that is recirculated out of a well casing, the apparatus comprising:

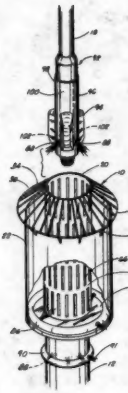
a. a flow conveying tubular section, sealably attachable at its first lower end to the well casing for allowing fluid flow therethrough and open-ended at its top portion;

b. an outer tank portion being at least twice the diameter of said flow conveying tubular section, encapsulating substantially the upper half portion of said tubular section, said tank portion being substantially open-ended at its top portion and attached at its bottom portion to the outer surface of said flow conveying tubular section and defining a container for receiving said filtered flow from said tubular section;

c. primary filter means comprising a plurality of vertical slotted vents equally and circumferentially spaced around

the wall of that portion of said tubular section within said tank portion and in fluid communication therewith for conveying fluid out of said tubular section and into said tank portion as said fluid containing solids travels up said tubular section;

d. means for restricting the fluid flow through said primary filter means rotatably mounted on said tubular section, said means further comprising a sleeve within said tubular section having a plurality of vertical slotted vents spaced around the wall of said sleeve, rotatably mounted and selectively adjustable between a first open position allowing fluid flow through said vents in said sleeve and said



tubular section to said tank portion, and a second closed position blocking fluid flow between said sleeve and said tubular section;

e. means for securing said sleeve in a selected flow controlling position;

f. secondary filter means interconnecting the top of said tubular section to the top of said tank portion for filtering solids flowing out of the top of said tubular section and allowing filtered fluid to flow into said tank;

g. means extending from the upper edge of said sleeve adapted to support said sleeve on said tubular section; and

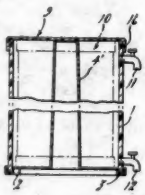
h. fluid conveying means for conveying filtered fluid out of said tank portion.

4,599,173

CLEANING FLUID VESSEL FOR IMMERSION OF CARTRIDGE-TYPE FILTER MEDIA

Direk V. Berger, 3861 Peabody Dr., Bloomfield Hills, Mich. 48013

Filed Jun. 6, 1984, Ser. No. 617,980
Int. Cl.[4] B01D *27/12, 29/38, 41/00*
U.S. Cl. 210—451 **4 Claims**



1. A cleaning fluid vessel for immersion of cartridge-type filter media therein, comprising:

a circuit of sides having a means defining a top and a bottom opening aligned perpendicularly to the central axis of said circuit of sides; the interior surface of said circuit of sides conforming to the peripheral contour of a cartridge-type filter media;

a bottom wall in contact with said means defining a bottom opening of said circuit of sides; said bottom wall having a raised central hub portion having a decreasingly upward tapered profile with an uppermost radial dimension less than said cartridge-type filter media inside radial dimension, and wherein said decreasingly upward tapered profile ends at the intersection with said bottom wall with an outside radial dimension less than the respective inside radial dimension of said cartridge-type filter media;

a removable lid member which contacts the top plane of said circuit of sides; and

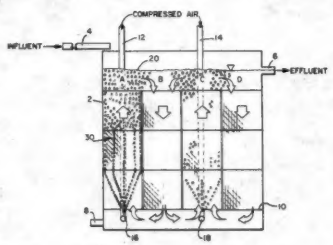
said circuit of sides, said bottom wall, said lid member being resistant to corrosion from said cleaning fluid.

4,599,174

SUBMERGED FIXED FILM BIOLOGICAL TREATMENT SYSTEM

Curtis S. McDowell, Allentown, Pa., assignor to Polybac Corporation, Allentown, Pa.

Filed Feb. 27, 1984, Ser. No. 583,778
Int. Cl.[4] C02F *3/06*
U.S. Cl. 210—614 **12 Claims**



1. In an aerobic process for treating an aqueous liquor containing a biodegradable waste product wherein the liquor is introduced into a container and the waste product biologically digested as it is passed through the container from an inlet to an exit, said biological digesting being accomplished by contacting the liquor with an oxygenating gas in the presence of a submerged porous mass supporting aerobic microorganisms;

the improvement for effecting efficient oxygen transfer and utilization which comprises:

establishing and maintaining at least a first and second vertically extending chamber within said tank, said chambers being in fluid communication with each other at the upper and lower ends;

establishing and maintaining a corrugated packing within said first and second chambers, said corrugated packing having channels defining a serpentine pathway in the vertical direction;

passing liquor and oxygenating gas upwardly through said corrugated packing in at least one of said first vertically extending chambers generating an oxygen rich liquor whereby a portion of the waste product is biologically digested by microorganisms supported on said corrugated packing, and;

returning a portion of oxygen rich undigested liquor from said first chamber downwardly through said second vertically extending chamber and in contact with microorganisms supported by the packing and then returning a portion of the liquor into a first chamber.

4,599,175

PROCESS FOR SEPARATING AND PURIFYING METALLIC ELEMENTS BY DISPLACEMENT CHROMATOGRAPHY

Takafumi Yamamizu, Yokohama, and Fumiaki Kawakami, Hyuga, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 18, 1984, Ser. No. 651,850
Claims priority, application Japan, Sep. 30, 1983, 58-180619
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—635 15 Claims

1. A process for separating and purifying metallic elements by displacement chromatography, which comprises the steps of:

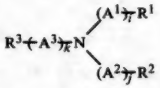
(1) in either order,

(a) packing a column with a resin; and

(b) treating the resin with a regenerative solution containing an activator,

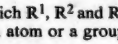
to obtain a column of an activated resin;

said resin being one having a chelating group of a structure derived by removing a hydrogen atom from a chelating compound of the formula:



(I)

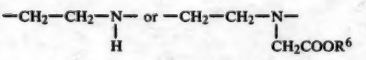
in which R^1, R^2 and R^3 each independently represent a hydrogen atom or a group of the formula:



$$-CH_2COOR^5$$

in which R^5 represents a hydrogen atom, a metal atom or a hydrocarbon residue having 1 to 4 carbon atoms;

A^1, A^2 and A^3 each independently represent a group of the formula:



$$-CH_2-CH_2-\underset{\underset{H}{|}}{N}- \text{ or } -CH_2-CH_2-\underset{\underset{CH_2COOR^6}{|}}{N}-$$

in which R^6 has the same meaning as that of R^5; and i, j and k each independently are an integer of 0 to 3, exclusive of the case of all of i, j and k being concurrently 0;

(2) passing through the column of the activated resin a solution containing a plurality of metallic elements to be separated to adsorb the elements on the activated resin, thereby forming an adsorption band of the metallic elements in the column packed with the activated resin;

(3) passing an eluent through the column of the resin having the adsorption band of the metallic elements to form the individual metallic elements into bands;

(4) further passing an eluent through the column, causing the bands of the individual metallic elements to pass down the column; and

(5) collecting successive portions of the resultant eluate.

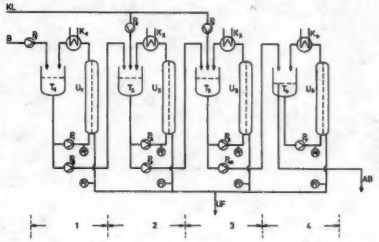
4,599,176

PROCESS FOR THE PRODUCTION OF CELL STIMULATING AGENTS

Udo Wittenberger, Pratteln, Switzerland, assignor to Solco Basel AG, Basel, Switzerland

Filed May 19, 1983, Ser. No. 495,956
Claims priority, application Fed. Rep. of Germany, May 21, 1982, 3219248
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—639 17 Claims

1. A process for obtaining a solution of cell respiration stimulating active agents from calves blood, which comprises the steps of defibrinating fresh calves blood, hemolysing the defibrinated calves blood, subjecting the hemolysed calves blood to a membrane ultrafiltration procedure with an ultrafiltration membrane to separate an ultrafiltrate solution comprising a blood extract containing respiration stimulating active agents having a molecular weight of below 8000 Dalton from an ultrafiltered load, and subjecting said ultrafiltrate solution to an electrodialysis procedure at a current density of from 5 to 70 ma/cm^2, at a direct current of from 0.2–2 volts, and at a temperature of from 0° to 30° C. with electrodialysis membranes



having a permeability up to a molecular weight of about 300 Dalton to partially separate out inorganic salts and aother ionic lower molecular weight substances from said ultrafiltrate solution without significantly changing the composition of the blood extract with respect to its organic components and to form a solution having a conductivity of from 40 to 75 mS/cm and a density at 20° C. of from 1.05 to 1.08 g/ml.

4,599,177

PROCESS FOR REMOVAL OF MERCURY FROM WASTE WATER

Saburo Hayashi; Mitsukazu Mukai, both of Kakogawa; Masahiro Inoue, Hyogo; Hiroo Tsuchiya, Kakogawa; Akira Otsuji, Hyogo, and Takeo Tanabe, Nara, all of Japan, assignors to Seitetsu Kagaku Co., Ltd., Miyanishi, Japan

Continuation-in-part of Ser. No. 502,972, Jun. 10, 1983, abandoned. This application Apr. 4, 1984, Ser. No. 597,237
Claims priority, application Japan, Jun. 22, 1982, 57-108194; Jun. 22, 1982, 57-108195; Jun. 22, 1982, 57-108196
Int. Cl.[4] C02F *1/62*
U.S. Cl. 210—718 15 Claims

1. A process for the removal of mercury from muicipal incinerator waste water containing mercury and other heavy metals, comprising first adding ozone to the waste water, then adding hydrazine to obtain a reaction mixture, subjecting the reaction mixture to stripping treatment at a temperature of not lower than 15° C. in the presence of ferrous ion to obtain a gas mixture containing mercury vapor and cooling the gas mixture to separate the mercury therefrom simultaneously with rendering the residual waste water harmless.

4,599,178

RECOVERY OF GLYCERINE FROM SALINE WATERS

George C. Blytas, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 16, 1984, Ser. No. 631,125
Int. Cl.[4] B01D *17/00*
U.S. Cl. 210—737 5 Claims

1. A process for recovering glycerine from a saline aqueous stream resulting from the manufacture of epoxy resins and containing from about 1 to about 7% w glycerine and at least about 5% w sodium chloride which process comprises:

(a) evaporating the feed stream to remove water and to precipitate at least about 85% of the salt content of the feed stream,

(b) separating the liquid phase from the precipitated salt,

(c) diluting the liquid phase product of step b in a detention zone with an aqueous stream to obtain a diluted liquid

phase product having a viscosity less than about 10 centipoise,

(d) subjecting the product of step c to an electrodialysis step in which the saline components migrate through fixed anion and cation exchange membranes to a concentrate stream or streams leaving a diluate stream or streams reduced in saline content,

(e) recycling the concentrate stream from step d to the evaporating step a, and

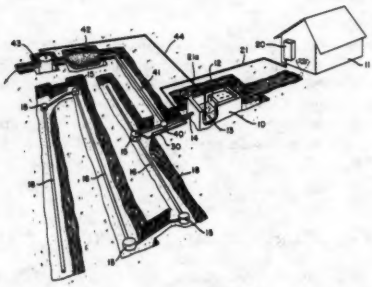
(f) recovering glycerine from the diluate stream of step d by fractional distillation.

4,599,179

METHOD AND APPARATUS FOR TREATING SEPTIC SYSTEM WITH RADIATION ACTIVATED FLUID

Andrew J. Pincon, 1819 W. Grand Ave., Chicago, Ill. 60622

Filed Jul. 12, 1983, Ser. No. 512,919
Int. Cl.[4] C02F *1/78*
U.S. Cl. 210—760 11 Claims



1. In a method of on-site treatment of septic tank waste liquid containing suspended solids, dissolved metal salts, organic matter, and micro-organisms for prolonging the useful life of an aqueous septic system including a septic tank having a spaced subsurface discharge area for liquid from said septic tank with conduit means for conveying said liquid from said tank to said discharge area, the improvement comprising: feeding substantially continuously into said liquid in said septic tank after a reduction in the concentration of suspended solids therein a fine dispersion of a radiation activated gaseous fluid in an amount which reacts with suspended solids, dissolved metal salts and organic matter in said liquid and which is conveyed by said liquid into said discharge area where said fluid reacts with solids formed in said discharge area including insoluble sulfides and organic deposits which impede the permeability of said subsurface discharge area to liquid conveyed thereto from said septic tank, said radiation activated gaseous fluid produced by irradiating a gas containing oxygen and moisture with electromagnetic radiation predominantly below a wave-length of 200 nanometers; and said gaseous fluid characterized by:

(1) a solution thereof is sulfuric acid at pH 1.5 exhibiting chemilluminesence at 190 nanometers;

(2) absorbing light weakly at 254 nanometers in the gaseous phase;

(3) oxidizing 20 mg/l resorcinol to CO_2 and H_2O at pH 6.4;

(4) reducing surface tension of distilled water by about 20 dynes cm^2;

(5) having an ultraviolet spectrum when measured following irradiation in a polyvinyl chloride enclosure and subsequent dissolving of the product in sulfuric acid at a pH of 1.5 which includes emission in a frequency range including 200 nanometers; and

(6) having an ultraviolet spectrum when measured following irradiation in a polyvinyl chloride enclosure and subsequent dissolving of the product in phosphoric acid at a pH of 1.5 which includes absorption at 195 nanometers and at 254 nanometers;

whereby said discharge area remains permeable to liquid from said septic tank for a prolonged period.

4,599,180

PROCESS OF THERMAL STABILIZATION OF AQUEOUS SOLUTIONS OF POLYSACCHARIDES AND ITS APPLICATION TO DRILLING FLUIDS

Lino Vio, Pau, and Gilles Meunier, Lescar, both of France, assignors to Societe Nationale Elf Aquitaine, France

Filed Sep. 28, 1984, Ser. No. 655,862
Claims priority, application France, Sep. 28, 1983, 83 15408
Int. Cl.[4] C09K *3/00;* E21B *0/00*
U.S. Cl. 252—8.55 D 9 Claims

1. A method of heat stabilizing an aqueous solution of xanthan or scleroglucan which consists essentially of dissolving 150 to 5,000 parts per million of an alkali metal dialkyl dithiocarbamate, the alkyls of which each contain 1 to 12 carbon atoms, in said solution and maintaining an amount of sodium chloride in said solution at a concentration of 0.4 to 6N.

4,599,181

HUMIC SUBSTANCES WITH ENHANCED SURFACE CHARGE

Jack C. Cowan, Lafayette, La., assignor to Venture Chemicals, Inc., Lafayette, La.

Filed Feb. 25, 1985, Ser. No. 705,283
Int. Cl.[4] C09K *7/02*
U.S. Cl. 252—8.5 C 20 Claims

1. A method of enhancing the electronegative surface charge of a humic acid-containing material which comprises reacting said humic acid-containing material which has a moisture content from about 0% to about 35% by weight and which contains at least 50% humic acid as measured by the percentage of said humic acid-containing material which is soluble in aqueous sodium hydroxide at a concentration of 5% of said humic acid-containing material and at a pH of 10 with anhydrous hydrochloric acid at a temperature in the range from about 30° C. to about 100° C., wherein the amount of said anhydrous hydrochloric acid is from about 1% to about 10% by weight of said humic acid-containing material.

15. A method of reducing the viscosity of a water-based drilling mud which comprises adding to said drilling mud a viscosity reducing amount of a humic acid-containing material whose electronegative surface charge has been enhanced by the method of claim 1.

4,599,182

WELL TREATING COMPOSITION AND METHOD

Peter J. Young, and Julian M. E. Romocki, both of Calgary, Canada, assignors to Amerigo Technology Limited, Calgary, Canada

Continuation of Ser. No. 97,151, Nov. 26, 1979, abandoned. This application Apr. 21, 1983, Ser. No. 487,049
Claims priority, application Canada, Apr. 20, 1979, 325951
Int. Cl.[4] E21B *43/27*
U.S. Cl. 252—8.55 C 16 Claims

1. A workover and completions fluid for use in a well completed in a limestone or dolomitic formation or a sandstone formation having a substantial carbonate content comprising an acidic aqueous solution comprising from about 5 to about 36 weight % phosphoric acid, from about 0.6 to about 5 weight % of a highly polar surface active agent which is a citric acid-monoethanolamine elimination reaction product characterized by a visible absorption spectrum which displays an increasing extinction coefficient from the red to the near U.V. with some structure, an absorption maximum at 475 nm, a plateau from 460 nm to 465 nm, an absorption maximum at 450 nm and extinction coefficients as follows:

$\epsilon_{475}=0.325$ l/gm.cm

ϵ_{462}=0.379 l/gm.cm
ϵ_{450}=0.509 l/gm.cm,
an effective amount of a ferrous metal corrosion inhibitor, and an amount of a phosphate crystal modifying agent sufficient to control crystal growth, minimize crystal agglomeration and minimize crystal adhesion to the formation said phosphate crystal modifying agent being selected from the group consisting of polyacrylate polymers and blends of such polymers with a phosphonic acid or a phosphonate.

4,599,183
MULTIFUNCTIONAL ADDITIVES
Andrew G. Horodysky, Cherry Hill; Joan M. Kaminski, Mullica Hill; Henry Ashjian, E. Brunswick, and Henry A. Gawel, Clark, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Sep. 19, 1983, Ser. No. 533,728
Int. Cl.[4] C10M *1/32, 1/48*
U.S. Cl. 252—32.7 E 25 Claims

1. A lubricant composition comprising a major proportion of an oil of lubricating viscosity or grease or other solid lubricant prepared therefrom and a minor effective proportion of a multifunctional friction reducing/high temperature stabilizing additive compound consisting of a C_8 to C_{30} hydrocarbyl triamine borate adduct or mixtures thereof.

4,599,184
PROCESS FOR PRODUCING FERROMAGNETIC LIQUID
Isao Nakatani, Funabashi, and Katashi Masumoto, Tokyo, both of Japan assignors to National Research Institute for Metals, Tokyo, Japan
Filed Jan. 29, 1985, Ser. No. 696,246
Claims priority, application Japan, Feb. 1, 1984, 59-15281
Int. Cl.[4] C04B *35/26;* B01J *13/00*
U.S. Cl. 252—62.51 11 Claims

1. A process for producing a ferromagnetic liquid comprising fine particles of a ferromagnetic material having a particle diameter of 10–100 Å and a surface-active liquid, wherein a step of heating said ferromagnetic material to evaporate it and a step of bringing the resulting vapor of the ferromagnetic material obtained from said heating and evaporating step into contact with the surface-active liquid being stirred are carried out substantially simultaneously in one and the same vessel, the surface-active agent of the surface-active liquid having a saturation or dissociation vapor pressure of not more than 10^{-1} mmHg at 50°–200° C., and the liquid of the surface-active liquid having a saturation or dissociation vapor pressure of not more than 10^{-1} mmHg at 50° C.

4,599,185
REFRIGERANT ADDITIVE AND METHOD FOR REDUCING CORROSION IN REFRIGERATION SYSTEMS
James A. Towers, Mt. Prospect, and Robert H. Krueger, Palatine, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.
Filed Mar. 25, 1985, Ser. No. 715,450
Int. Cl.[4] C09K *5/04;* C10M *129/16, 133/08, 137/04*
U.S. Cl. 252—68 6 Claims

1. In a refrigeration system containing a working fluid comprising a halogenated hydrocarbon refrigerant and a lubricant, the improvement wherein an effective, corrosion-preventing amount of a phospholipid is included in said working fluid.

2. In the refrigeration system of claim 1, the improvement wherein said phospholipid is lecithin.

4,599,186
THICKENED AQUEOUS ABRASIVE SCOURING CLEANSER
Clement K. Choy, Walnut Creek, and Frederick I. Keen, Livermore, both of Calif., assignors to The Clorox Company, Oakland, Calif.
Filed Apr. 20, 1984, Ser. No. 603,266
Int. Cl.[4] C11D *1/75, 1/83, 3/14, 3/395*
U.S. Cl. 252—102 22 Claims

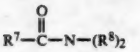
1. A hard surface liquid abrasive scouring cleanser comprising:
(a) a colloidal aluminum oxide thickener;
(b) an electro/buffer in an amount sufficient to promote an environment in which the surfactant of (c) and the aluminum oxide of (a) can favorably associate;
(c) a bleach-stable nonionic surfactant which is an amine oxide;
(d) a halogen bleach; and
(e) a particulate abrasive to provide scouring action; said aluminum oxide and said surfactant being present in a mixture suitable for providing bleach stability, substantial lack of phase separation and stable suspension of the abrasive.

4,599,187
CLEANING COMPOSITIONS BASED ON TRICHLOROTRIFLUOROETHANE AND ALCOHOLS
David G. Hey, Northwich, England, assignor to Imperial Chemical Industries PLC, London, England
Filed Mar. 2, 1983, Ser. No. 471,334
Claims priority, application United Kingdom, Mar. 18, 1982, 8207905
Int. Cl.[4] C11D *3/44*
U.S. Cl. 252—171 9 Claims

1. A cleaning composition comprising 1,1,2-trichloro-1,2,2-trifluoroethane and a monohydric lower aliphatic alcohol having from 1 to 3 carbon atoms and containing additives and which boils within ±2° C. of the boiling point of the azeotropic mixture of the 1,1,2-trichlor-1,2,2-trifluoroethane and the aliphatic alcohol having from 1 to 3 carbon atoms, the additives each being present in an amount of from 0.5 to 4% by weight and being a monohydric aliphatic alcohol having from 4 to 6 carbon atoms and ethylene glycol.

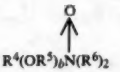
4,599,188
FOAMING SURFACTANT COMPOSITIONS
Ramon A. Llenado, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Continuation-in-part of Ser. No. 371,695, Apr. 26, 1982, abandoned. This application Jul. 12, 1982, Ser. No. 397,000
The portion of the term of this patent subsequent to Aug. 2, 2000, has been disclaimed.
Int. Cl.[4] C11D *1/74, 1/83*
U.S. Cl. 252—174.17 12 Claims

1. A foaming composition comprising
(1) an alkylpolysaccharide surfactant having the formula $RO(R^1O)_t(Z)_x$ wherein Z is a moiety derived from a reducing saccharide containing from 5 to 6 carbon atoms and wherein R is an alkyl, alkylphenyl, hydroxy alkylphenyl or hydroxyalkyl hydrophobic group or mixtures thereof in which said alkyl groups contain from about 8 to about 18 carbon atoms; R^1 contains from 2 to about 4 carbon atoms; t is from 0 to about 30; and x is a number from about 1.5 to about 10;
(2) an anionic cosurfactant selected from the group consisting of sulfates, sulfonates, carboxylates and mixtures thereof neutralized with one or more cationic moieties, the ratio of (2) to (1) being from about 1:10 to about 10:1; and
(3) from about 2% to about 10% of an auxiliary foam booster selected from the group consisting of:
(a) amides having the formula



wherein R^7 is an alkyl group containing from about 8 to about 18 carbon atoms and each R^8 is the same or different and is selected from the group consisting of hydrogen, C_{1-3} alkyl, C_{1-3} alkanol, and $-(C_2H_4O-)_{1-4}H$ groups and mixtures thereof;

(b) amine oxides having the formula:



wherein R^4 is an alkyl group containing from about 8 to about 18 carbon atoms, each R^5 contains from two or three carbon atoms, b is from 0 to about 30, each R^6 is the same or different and is selected from the group consisting of C_{1-3} alkyl, C_{1-3} alkanol, and $-(C_2H_4O)_{1-6}H$ groups and mixtures thereof; and

(c) mixtures thereof.

4,599,189

PARAFFIN-CONTAINING DEFOAMING COMPOSITIONS AND DETERGENT COMPOSITIONS CONTAINING SAME

Juan C. Wuhrmann; Karl D. Brands, both of Duesseldorf; Heinz Mueller, Wuppertal; Klaus Schumann, Erkrath, and Theodor Altenschoepfer, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 17, 1984, Ser. No. 682,390

Claims priority, application Fed. Rep. of Germany, Jan. 2, 1984, 3400003

Int. Cl.[4] B01D *19/04;* **C09K** *3/00;* **C11D** *7/16, 7/26*

U.S. Cl. 252—174.15 **25 Claims**

10. A defoaming composition of matter consisting essentially of (A) from about 60 to about 99 parts by weight of a carrier, and (B) a physical mixture of (1) from about 0.05 to about 25 parts by weight of pyrogenic, hydrophobized silica, and (2) from about 3 to about 25 parts by weight of a mixture of waxes containing

(a) from-about 20 to about 60% by weight of microcrystalline paraffin wax having a solidification point ranging from about 60° to about 95° C.,

(b) from about 15 to about 60% by weight of hard paraffin having a solidification point ranging from about 40 to about 60° C., and

(c) from about 1 to about 50% by weight of soft paraffin having a solidification point ranging from about 32° to about 42° C.;

and said silica and said mixture of waxes being present in an amount effective to reduce the foaming of a dishwashing detergent.

23. A defoaming detergent comprising:

(I) a dishwashing detergent component; and

(II) from about 0.5 to about 5% by weight of the detergent component of a defoamer component consisting essentially of:

(A) from about 60 to about 99 parts by weight of a carrier, and

(B) a physical mixture of

(1) from about 0.05 to about 25 parts by weight of pyrogenic, hydrophobized silica, and

(2) from about 1 to about 30 parts by weight of a mixture of waxes containing

(a) from about 20 to about 60% by weight of microcrystalline paraffin wax having a solidification point ranging from about 60° to about 95° C.,

(b) from about 15 to about 60% by weight of hard paraffin having a solidification point ranging from about 40° to about 60° C., and

(c) from about 1 to about 50% by weight of soft paraffin having a solidification point ranging from about 32° to about 42° C.

4,599,190

COMPOSITION FOR DEINKING SECONDARY FIBERS

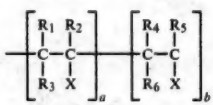
James E. Maloney, Eagan, Minn., assignor to Diamond Shamrock Chemicals Company, Dallas, Tex.

Continuation of Ser. No. 206,142, Nov. 12, 1980, abandoned, which is a continuation of Ser. No. 458,432, Jan. 17, 1983, Pat. No. 4,518,459, which is a continuation of Ser. No. 93,744, Nov. 13, 1979, abandoned. This application Jul. 13, 1984, Ser. No. 630,540

Int. Cl.[4] C11D *1/72;* **D21C** *5/02*

U.S. Cl. 252—174.24 **6 Claims**

1. A deinking medium for use in an aqueous washing method for deinking secondary fiber comprising water, 5–500 ppm of a water-soluble polymeric polyelectrolyte dispersant of the formula:



wherein R_1, R_2, R_4 and R_5 are H, C_1–C_4 lower alkyl, alkylcarboxy or mixtures thereof, R_3 and R_6 are H, carboxy, alkylcarboxy or mixtures thereof, and X is carboxy, CO_2NH_2, acetyl or C_6H_5 wherein a + b has a value so that the molecular weight of the polyelectrolyte dispersant is within the range of about 500–5,000; and an amount of a nonionic surfactant of the formula: nonylphenol$(EtO)_{9.5}(PrO)_{6-24}$-H effective to deink said fiber.

4,599,191

FRICTION REDUCING ADDITIVES AND COMPOSITIONS THEREOF

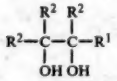
Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 1, 1984, Ser. No. 605,742

Int. Cl.[4] C10M *137/08*

U.S. Cl. 252—32.5 **21 Claims**

1. A lubricant composition comprising a major proportion of an oil of lubricating viscosity or grease prepared therefrom and a minor effective proportion of a friction reducing additive consisting of monoamine, diamine or triamine salts or mixtures thereof of diol-derived acid phosphates wherein said diol is a long chain vicinal diol having the following general structure:



where

R^1 = C_8–C_{30} hydrocarbyl

and R^2 = hydrogen or C_1–C_6 hydrocarbyl

and wherein said amines have the following general structure;

where R^3 = C_8–C_{10} hydrocarbyl or hydrocarbyloxy hydrocarbylene, R^4 = C_2–C_4 hydrocarbylene and x = 0, 1, or 2.

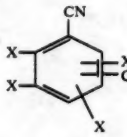
4,599,192

WOOD-TREATING COMPOSITION

John T. Rose, Charlotte, N.C., assignor to Mineral Research and Development Corp., Charlotte, N.C.

Filed Aug. 24, 1983, Ser. No. 525,882
Int. Cl.[4] A01N *9/20;* A01A *9/24*
U.S. Cl. 252—383 16 Claims

1. A wood-treating composition useful for the preventive control of surface molds and as a wood preservative, consisting essentially of a concentration of chromated copper arsenate effective as a wood preservative when applied to wood, and an amount of a chemically compatible, halogenated benzene dinitrile effective to protect wood against surface molds when applied to wood, said amount being at least about 40 ppm, and the benzene dinitrile being of the general formula



wherein each X is selected from the group consisting of hydrogen, chlorine, fluorine and bromine, with at least one X being other than hydrogen; and said wood-treating composition being free of working solution sludge caused by reaction between said halogenated benzene dinitrile and said chromated copper arsenate.

4,599,193

HIGHLY ELECTROCONDUCTIVE PYROLYZED PRODUCT RETAINING ITS ORIGINAL SHAPE AND COMPOSITION FORMED THEREFROM

Ichiki Murase, Otsu; Toshihiro Ohnishi, Takatsuki, and Takanobu Noguchi, Otsu, all of Japan, assignors to Director-General of the Agency of Industrial Science and Technology, an Organ of the Ministry of International Trade and Industry of Japan, Tokyo, Japan

Filed Jun. 20, 1984, Ser. No. 622,582
Claims priority, application Japan, Jun. 30, 1983, 58-117124; Feb. 28, 1984, 59-35319
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—511 12 Claims

1. A method for preparing a highly electroconductive carbonaceous material which comprises pyrolyzing in an inert atmosphere a conjugated polymer represented by the general formula

$$+R-CH=CH+_n$$

wherein R is an aromatic hydrocarbon group having 6 to 20 carbon atoms which forms a consective carbon to carbon conjugated system with the vinylene group, and n is an integer of 5 to 50,000, at a temperature of 400° to 3500° C.

4,599,194

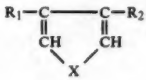
SIMULTANEOUS POLYMERIZATION, DOPING AND SOLUBILIZATION OF HETEROCYCLIC POLYMERS, SOLUTIONS AND CAST ARTICLES

Jane E. Frommer, Mendham Township, Morris County, and Ronald L. Elsenbaumer, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 18, 1984, Ser. No. 621,404
Int. Cl.[4] H01B *1/20;* A01B *1/06*
U.S. Cl. 252—518 33 Claims

1. A method of forming a solution which comprises reacting at least one monomer selected from the group consisting of heterocyclic aromatics having at least one chalcogenide, nitrogen or phosphorus heteroatom, or oligomers of such heterocyclic aromatics with an electron acceptor doping agent in the presence of a solvent selected from the group consisting of arsenic trifluoride, arsenic trichloride, arsenic tribromide, phosphorus trifluoride, phosphorus pentafluoride, phosphorus trichloride, phosphorus oxytrichloride, titanium tetrachloride, boron trifluoride, boron trichloride, boron tribromide, antimony trichloride, antimony pentachloride, and volatile chloroalkanes, the solvent being present in an amount sufficient to form a solution having a viscosity less than about 1000 centipoise, the resulting solution containing a polymer with repeat units derived from the monomer at least partially doped by a dopant derived from the doping agent.

2. The method of claim 1 wherein the monomer is a five-member monoheterocyclic aromatic of the formula:



wherein X is S, O, Se, NH, NR', PH or PR'; R_1 is H alkyl, —OR, —SR or aryl; R_2 is H, alkyl —OR, —SR or aryl, R is alkyl or aryl; and R' is alkyl or aryl.

4,599,195

SOLUTION AND METHOD FOR REMOVING PROTEIN, LIPID, AND CALCIUM DEPOSITS FROM CONTACT LENSES

Doris Schäfer, and Rolf Schäfer, both of Arisdorf, Switzerland, assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Dec. 28, 1984, Ser. No. 687,274
Int. Cl.[4] C11D *1/06, 3/33*
U.S. Cl. 252—546 5 Claims

1. An aqueous contact lens cleaning solution, comprising an effective amount of an anionic surfactant formula:

$$R\text{-}O\text{-}(CH_2\text{-}CH_2\text{-}O)_z\text{-}CH_2\text{-}COOH$$

in which R is a C_8 to C_{18} hydrocarbon chain and z is a whole number from 1 to 25; an effective amount of a calcium chelating agent selected from the group consisting of citric acid, ethylenediaminetetraacetic acid and combinations thereof; and a source of hydrated protons to facilitate removal of protein deposits from contact lenses, said source of hydrated protons comprising an acid capable of providing free hydrogen ions when in solution at acid pH in an amount sufficient to render the aqueous contact lens cleaning solution slightly acidic, said acid being selected from the group consisting of citric acid, ethylenediaminetetraacetic acid, sodium dihydrogen phosphate, gluconic acid and combinations thereof.

4,599,196

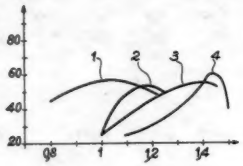
PROCESS FOR THE CONDITIONING OF CONTAMINATED WASTE, PARTICULARLY CATION EXCHANGE MATERIALS

Christian de Tassigny, Sassenage, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 9, 1984, Ser. No. 598,528
Claims priority, application France, Apr. 21, 1983, 83 06572
Int. Cl.[4] G21F *9/16;* B05D *3/00;* C08F *8/32*
U.S. Cl. 252—628 13 Claims

1. A process for the conditioning of waste, whose acidity can inhibit polymerization reactions, consisting of incorporating said waste into a liquid thermosetting resin consisting essentially of epoxy resin at ambient temperature, polymerizing the resin by using a hardener comprising an aliphatic polyamine

and an aromatic amine having at least one NH_2 group, for blocking the acidity of the waste and for polymerizing the



epoxy resin to obtain a solid block of polymerized resin including said waste.

4,599,197

PURIFICATION AND ACTIVITY ASSURANCE OF PRECIPITATED HETEROLOGOUS PROTEINS

Ronald B. Wetzel, San Francisco, Calif., assignor to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 452,187, Dec. 22, 1982, abandoned. This application Jun. 1, 1984, Ser. No. 615,677

Int. Cl.[4] C07G *3/20, 3/22*

U.S. Cl. 530—405 **17 Claims**

1. A process for re-activating proteins formed as refractile bodies in host cells, said proteins not subjected to CNBR treatment which process comprises:

(a) converting said proteins not subjected to CNBR treatment and dissolved in a strongly denaturing solution to the corresponding protein-S-sulfonate;

(b) converting the strongly denaturing solution to a weakly denaturing solution in which the protein-S-sulfonate remains dissolved; and

(c) treating the resulting protein-S-sulfonate with a sulfhydryl containing moiety containing a small percentage of its disulfide.

4,599,198

INTERMEDIATES IN POLYPEPTIDE SYNTHESIS

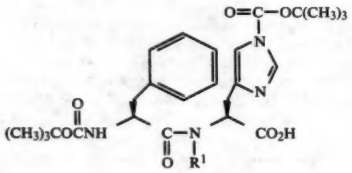
Dennis J. Hoover, Ledyard, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 762,099, Aug. 2, 1985. This application Sep. 26, 1985, Ser. No. 780,353

Int. Cl.[4] C07K *5/06*

U.S. Cl. 260—998.2 **3 Claims**

1. A compound of the formula



wherein R^1 is selected from the group consisting of hydrogen and methyl.

4,599,199

OBTAINING CAPROLACTAM FROM EPSILON-AMINOCAPROIC ACID

Hugo Fuchs, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 31, 1985, Ser. No. 696,796

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1984, 3403574

Int. Cl.[4] C07D *201/08*

U.S. Cl. 260—239.3 A **5 Claims**

1. A process for obtaining caprolactam from ϵ-aminocaproic acid, which comprises treating ϵ-aminocaproic acid in a fluidized alumina bed in the presence of steam at from 290° to 400° C.

4,599,200

PROCESS FOR THE PRODUCTION OF 17α-ACETOXY-1α,2α-METHYLENE-4,6-PREGNADIENE-3,20-DIONE

Hanfried Arnold, Berlin, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Sep. 7, 1984, Ser. No. 648,202

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1983, 3332590

Int. Cl.[4] C07J *71/00*

U.S. Cl. 260—239.55 C **7 Claims**

1. A process for the production of 17α-acetoxy-1,2-methylene-4,6-pregnadiene-3,20-dione comprising ketalizing the 20-keto group of 17α-hydroxy-1,4,6-pregnatriene-3,20-dione with ethylene glycol in the presence of a trialkyl formate and a strong acid; methylenating the resultant 20-ketal steroid in the 1,2-position by reacting it with trimethylsulfoxonium iodide in a polar aprotic solvent in the presence of a strong base; hydrolyzing the resultant product; and acetylating the resulting 17α-hydroxy-1,2-methylene-4,6-pregnadiene-3,20-dione by reacting it with a reactive derivative of acetic acid in the presence of a strong inorganic or organic sulfonic acid.

7. 17α-hydroxy-1,4,6-pregnatriene-3-one-20-ethylene ketal.

4,599,201

PROCESS FOR PREPARING CERIC CARBOXYLATES

Peter S. Gradeff, Pottersville, and Vincent J. Charte, East Windsor, both of N.J., assignors to Rhone-Poulenc, Inc., New Brunswick, N.J.

Continuation of Ser. No. 367,310, Apr. 12, 1982, abandoned. This application Aug. 6, 1984, Ser. No. 637,940

Int. Cl.[4] C01F *17/00;* **C11C** *1/00*

U.S. Cl. 260—414 **22 Claims**

1. A process for preparing ceric carboxylates which comprises oxidizing a cerous carboxylate of an organic carboxylic acid selected from the group consisting of aliphatic and cycloaliphatic saturated and unsaturated carboxylic acids and mixtures thereof having from about seven to about eighteen carbon atoms with aqueous hydrogen peroxide in a two-phase system comprising an aqueous phase of hydrogen peroxide having a pH of at least 6 and an organic phase comprising a solution of cerous carboxylate in a water-immiscible hydrocarbon solvent at a temperature at which the reaction proceeds but below the temperature of rapid decomposition of hydrogen peroxide, thereby converting cerous to ceric ion and forming a solution of ceric carboxylate in the hydrocarbon solvent; heating the reaction mixture at a temperature at which any ceric-hydrogen peroxide complexes present are decomposed; and separating the organic phase containing ceric carboxylate from the aqueous phase of the reaction mixture.

4,599,202

PREPARATION OF ADIPODINITRILE

Toni Dockner, Meckenheim; Manfred Sauerwald, Roedersheim-Gronau; Jost H. Manegold, Lambsheim, and Hans Leitner, Flomersheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 3, 1985, Ser. No. 751,390

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1984, 3424701

Int. Cl.[4] C07C *120/08*

U.S. Cl. 558—313 8 Claims

1. A process for the preparation of adipodinitrile which comprises reacting adipic acid with excess ammonia at from 250° to 350° C. in the liquid phase in the presence of, as a diluent, a liquid hydrocarbon having a boiling point of from 350° to 550° C., which is inert under the reaction conditions.

4,599,203

MULTISULFONATED NAPHTHALENE UREAS USEFUL AS COMPLEMENT INHIBITORS

Ransom B. Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 413,938, Sep. 1, 1982, abandoned, which is a continuation-in-part of Ser. No. 334,941, Dec. 28, 1981, abandoned. This application Mar. 28, 1984, Ser. No. 594,447

Int. Cl.[4] C07C *143/30*

U.S. Cl. 260—506 11 Claims

3. The compound 7,7'-ureylenedi-1,3,5-naphthalenetrisulfonic acid, hexasodium salt.

4,599,204

OXALYLAMIDES USEFUL AS DENTAL ANTIPLAQUE AGENTS AND INHIBITORS OF CONNECTIVE TISSUE DESTRUCTION

John F. Poletto, Westwood, N.J., and Seymour Bernstein, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

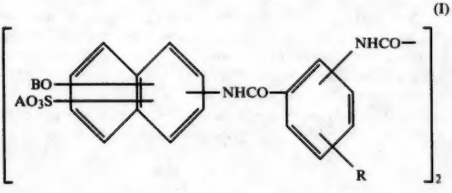
Filed Mar. 11, 1985, Ser. No. 711,112

Int. Cl.[4] C07C *143/30*

U.S. Cl. 260—507 R 5 Claims

1. A compound of the formula:

(I)



wherein A is hydrogen or a pharmaceutically acceptable salt cation; B is hydrogen, lower(C_1–C_6)alkanoyl or alkali metal; and R is hydrogen or lower(C_1–C_3)alkyl.

4,599,205

1-O-ALKYL-3-AMINO-PROPAN-1.2-DIOL-2-O-PHOSPHOLIPIDS

Hans-Heiner Lautenschläger, Pulheim-Stommeln; Michael J. Parnham, Cologne, and Gerrit Prop, Pulheim, all of Fed. Rep. of Germany, assignors to A. Nattermann & Cie GmbH, Cologne, Fed. Rep. of Germany

Filed Jun. 25, 1984, Ser. No. 624,004

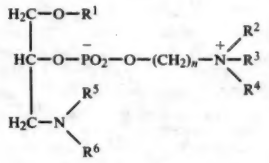
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1983, 3323871

Int. Cl.[4] C07F *9/10*

U.S. Cl. 558—170 2 Claims

1. 1-O-Alkyl-3-amino-propan-1.2-diol-2-O-phospholipids of the formula I

I



wherein

R^1 is a member selected from the group consisting of the saturated, straight-chain alkyl groups with 10 to 20 carbon atoms, the unsaturated, straight-chain alkyl groups with 10 to 20 carbon atoms, the saturated branched alkyl groups with 10 to 20 carbon atoms and the unsaturated branched alkyl groups with 10 to 20 carbon atoms,

R^2, R^3 and R^4 which may be the same or different from each other, represent a member selected from the group consisting of hydrogen and the lower alkyl group with 1 to 4 carbon atoms,

R^5 and R^6 which may be the same or different from each other, represent a member selected from the group consisting of hydrogen, the group $-A-C_mH_{2m}-R^7$ and the group $-A-C_mH_{2m-2}-R^7$,

R^7 is a member selected from the group consisting of hydrogen, unsubstituted phenyl and phenyl substituted by a C_{1-3}-alkyl, a C_{1-3}-alkoxy, a trifluoromethyl group or a halogen atom,

A is a member selected from the group consisting of a bond and the groups —CO—, —COO— and —CONR[8]—,

R^8 is a member selected from the group consisting of hydrogen and C_{1-4}-alkyl,

m is a numeral from 0 to 20 and

n is a numeral from 2 to 4.

4,599,206

TRANSITION METAL COMPLEX CATALYZED REACTIONS

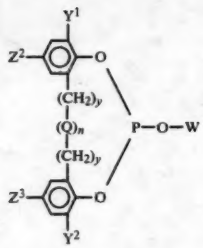
Ernst Billig; Anthony G. Abatjoglou, both of Charleston; David R. Bryant, South Charleston; Rex E. Murray, and John M. Mather, both of Charleston, all of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 581,352, Feb. 17, 1984, abandoned. This application Dec. 28, 1984, Ser. No. 685,025

Int. Cl.[4] C07F *9/02*

U.S. Cl. 558—85 5 Claims

1. A diorganophosphite ligand having the general formula



wherein Z^2 and Z^3 each individually represent a radical selected from the group consisting of hydroxy and an oxy radical —OR^6, wherein R^6 represents a substituted or unsubstituted monovalent hydrocarbon radical; wherein Y^1 and Y^2 each individually represents a radical selected from the group consisting of hydrogen, an alkyl radical having from 1 to 8 carbon atoms, substituted or unsubstituted aryl, alkaryl, aralkyl and alicyclic radicals; wherein W represents a substituted or unsubstituted monovalent hydrocarbon radical; wherein each y individually has a value of 0 to 1, wherein Q is a divalent bridging group selected from the class consisting of —CR^1R^2, —O—, —S—, —NR^3—, —SiR^4R^5— and —CO—, wherein each R^1 and R^2, radical individually represents a radical selected from the group consisting of hydrogen, alkyl of 1 to 12 carbon atoms, phenyl, tolyl and anisyl, wherein each R^3, R^4, and R^5 radical individually represents —H or —CH_3, and wherein n has a value of 0 or 1.

4,599,207

PROCESS FOR THE PREPARATION OF PHOSPHORUS-CONTAINING CYANOHYDRIN DERIVATIVES

Stephen Lachhein, Mörfelden-Walldorf, and Hilmar Mildenberger, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

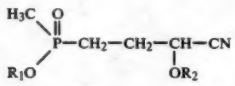
Filed May 29, 1984, Ser. No. 614,846

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1983, 3319850

Int. Cl.⁴ C07F 9/32

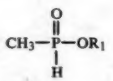
U.S. Cl. 558—137 **7 Claims**

1. A process for the preparation of a cyanohydrin of the formula I



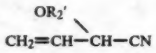
(I)

wherein R_1 is (C_1–C_6) alkyl, and R_2 is hydrogen, acetyl or propionyl, comprising the addition of a compound of the formula II



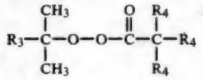
(II)

wherein R_1 is (C_1–C_6) alkyl with a compound of the formula III



(III)

wherein R_2' is acetyl or propionyl, in the presence of a radical forming agent of the formula IV



(IV)

wherein R_3 is (C_1–C_2) alkyl or phenyl, and R_4 is (C_1–C_{10}) alkyl, the R_4 radicals being identical or different, at a temperature in the range of 50° to 100° C., and, except in the preparation of a compound of the formula I wherein R_2 is H, the radical R_2' is then split off.

4,599,208

FOAM GENERATOR

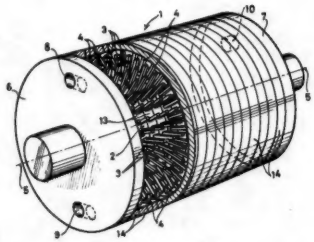
Cornelis Blaak, Boxmeer, Netherlands, assignor to Stork Brabant, An Boxmeer, Netherlands

Filed Jul. 26, 1984, Ser. No. 634,629

Claims priority, application Netherlands, Jul. 27, 1983, 8302678

Int. Cl.⁴ B01F 3/04

U.S. Cl. 261—83 **6 Claims**



1. A foam generator for producing a liquid/gas emulsion having a specific weight of at least 0.1 and comprising a hollow cylindrical stator and a cylindrical rotor coaxially rotatably driven therein, jointly forming a mixing chamber wherein there are disposed alternately in the direction of the longitudinal axis stator and rotor rings of pins having a constant polygonal cross section, said pins on said rotor ring each having a plurality of ribs, the stator ring of pins being stationary, and the rotor ring of pins being rotatable and each causing a vortex trail to be formed along the length of said ribs, said mixing chamber furthermore being provided at one end with an inlet for the liquid and for the gas, there being provided at the other end an outlet opening for the emulsion prepared, the mixing chamber of the foam generator, lying within a range for its sectional area (Q) between 40 and 90 cm^2, said generator having a vortex-line density coefficient (VLDC) being the quotient of the total length available within said mixing chamber of vortex-forming ribs of said rotor pins per volume of said mixing chamber, or:

$$\frac{\text{total vortex line length}}{\text{volume of mixing chamber}},$$

and amounting at least to 1.5.

4,599,209

METHOD OF PRODUCING ABSORBING WOUND DRESSING

Horst Dautzenberg; Fritz Loth, both of Teltow; Bodo Borrmeister, Potsdam-Babelsberg; Dieter Bertram, Leipzig; Herbert Lettau, Halle-Neustadt, all of German Democratic Rep.; Jiri Stamberg, and Jan Péska, both of Prague, Czechoslovakia, assignors to Veb Leipziger Arzneimittel Werk, Leipzig, German Democratic Rep.

Division of Ser. No. 412,858, Aug. 30, 1982, abandoned. This application Jul. 5, 1984, Ser. No. 627,485

Claims priority, application German Democratic Rep., Sep. 30, 1981, 2336844; Nov. 11, 1981, 2347334

Int. Cl.[4] B29B *9/00*

U.S. Cl. 264—7 **13 Claims**

1. Method of making an absorbing wound dressing, comprising the steps of mixing a viscose of technical conventional composition with 50% water soluble carboxylate groups containing polysaccharide derivative in dissolved or solid form selected from the group consisting of sodium carboxymethyl cellulose sodium carboxymethyl starch and sodium alignate, emulsifying said mixture with a dispersion medium which is not mixable with the viscose, then shaping the obtained mixture into specimen by thermal treatment at increased temperatures such that the specimen are coagulated and a particle formation with spherical particles of diameter >10 microns and $<$ one mm occurs therein, removing said dispersion medium from said particles, washing said specimen, and drying said specimen.

4,599,210

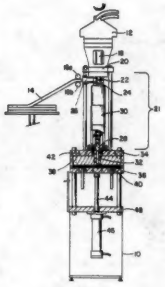
METHOD OF MOLDING RUBBER ARTICLES AND RUBBER MOLDING MACHINE

James A. Jennett, 1550 Kirkwood Dr., Geneva, Ill. 60134

Filed Sep. 14, 1984, Ser. No. 650,425

Int. Cl.[4] B29C *45/02*

U.S. Cl. 264—40.5 **9 Claims**



1. In a method of molding rubber articles comprising steps of transferring uncured rubber to a mold cavity and curing the rubber in the cavity to form a molded rubber article, the improvement comprising preparing the uncured rubber by extruding the rubber into an expandable chamber and controlling the pressure within said chamber to thereby regulate the temperature of the rubber whereby a measured amount of heated uncured rubber is produced for transfer to a mold cavity.

6. An improved apparatus for preparing rubber for a molding process comprising:

an extruder having an inlet for insertion of raw rubber stock at a first end thereof and having an outlet at the opposite end thereof for discharge of extruded rubber, wherein said extruder has a threaded shaft arranged for rotation within a housing, whereby rubber stock is transported from said inlet to said outlet, and further comprises a decreasing diameter of said shaft and housing whereby compression and heating of said rubber is caused thereby during the transport of said stock; and

an expandable chamber arranged to receive said extruded rubber, and having a hydraulic cylinder controlled platform representing part of said chamber to control pressure therein.

4,599,211

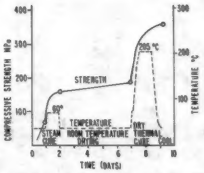
THERMAL TREATMENT OF CONCRETES CONTAINING STAINLESS STEEL

Sean Wise, Millersville, and Mark L. MacKenzie, Laurel, both of Md., assignors to Research One Limited Partnership, Towson, Md.

Filed Nov. 21, 1984, Ser. No. 673,843

Int. Cl.[4] C04B *40/00*

U.S. Cl. 264—82 **2 Claims**



1. A method of increasing the strength of a cementitious composite material containing irregularly shaped stainless steel particles comprising:

a. casting the composite material into a mold;

b. permitting the cast material to remain in the mold for between 20 and 48 hours at ambient room conditions;

c. demolding the cast material and steam curing the demolded material at 60° C. for at least 18 hours;

d. slow drying the steam cured material for at least one day at ambient room conditions and then

e. dry thermally curing the resulting material at an elevated temperature between 175° and 230° C. for between 20 and 48 hours.

4,599,212

LAMINATES HAVING AN IMPROVED FINISHING LAYER

Nicolas Meyer, Lens, and Michel Cousin, Loison sous Lens, both of France, assignors to Societe Chimique des Charbonnages S.A., Paris, France

Filed Dec. 30, 1983, Ser. No. 567,124

Claims priority, application France, Dec. 30, 1982, 82 22060

Int. Cl.[4] B29C *71/00;* **B32B** *27/08*

U.S. Cl. 264—255 **10 Claims**

1. In a process for producing a reinforced phenolic resin laminate comprising applying a coating directly to at least one side of said phenolic resin laminate to remove surface irregularities, the improvement wherein said coating is a composition consisting essentially of a butylated phenolic resin containing not more than 5% water.

4,599,213

NUCLEAR FUEL ASSEMBLY WITH REPLACEABLE FUEL ELEMENTS

Joseph Leclercq, St Didier Au Mont D'OR, and Alain Gagnard, Lyon, both of France, assignors to Framatome et Cogema, France

Filed Sep. 14, 1983, Ser. No. 532,057

Claims priority, application France, Sep. 16, 1982, 8215664

Int. Cl.[4] G21C *3/32*

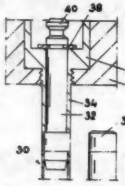
U.S. Cl. 376—446 **9 Claims**

1. Fuel assembly for a nuclear reactor of the type comprising:

a plurality of fuel elements each closed by end plugs; and

a structure comprising (a) an upper end part; (b) a lower end part; (c) a plurality of parallel tie rods fixed to said end parts; (d) grids fixed to said tie rods, distributed between said end parts, and cooperating with the end parts to hold the fuel elements at the nodes of an array formed thereby and of which other nodes are occupied by the tie rods; and (e) releasable connection means for connecting rigidly and individually at least one of said fuel elements located at a predetermined one of said nodes to one of said end parts, said connection means including

(i) an opening formed in said one of said end parts, aligned



with said node and having a cross section sufficient for insertion and removal of said one of said fuel elements through said one of said end plates, and

(ii) a retaining member insertable into said opening, said retaining member having an abutting connection with one of said fuel element and end part and a threaded connection with the other one of said fuel element and end part, said retaining member being shaped for engagement by a rotating tool from the outside of the fuel assembly, wherein said one of said fuel elements is connected to or disconnected from the associated end part without being subjected to a substantial torque exerted by said tool on said retaining member.

4,599,214

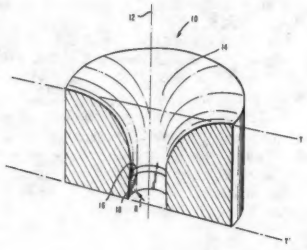
DISPERSION STRENGTHENED EXTRUDED METAL PRODUCTS SUBSTANTIALLY FREE OF TEXTURE

Michael J. Luton, Englewood, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 17, 1983, Ser. No. 524,028

Int. Cl.⁴ C22C *19/00*

U.S. Cl. 419—4 **38 Claims**



1. A method for extruding fine grain dispersion strengthened metallic powder material such that the resulting extruded product is substantially free of texture, which method comprises extruding a billet of dispersion strengthened metallic powder material comprised of one or more metals and one or more refractory compounds said powder material having a mean grain size less than about 5 microns and whose grain size is substantially stable at the extrusion conditions, through a die having an internal contour such that the material is subjected to a natural strain rate which is substantially constant as it passes through the die.

4,599,215

PROCESS AND DEVICE FOR PRODUCING COMPRESSED MOULDINGS FROM LOOSE OR SINTERED METAL POWDER

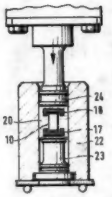
Wilfried Smarsly, Magazinstrasse 32, D-5000 Köln 90; Karl J. Grundhoff, Spitzwegstrasse 4, D-5210 Troisdorf, and Hartmut Schurmann, Dorfstrasse 176, D-5204 Lohmar-Krahwinkel, all of Fed. Rep. of Germany

Filed Nov. 26, 1984, Ser. No. 674,596

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1983, 3343210

Int. Cl.⁴ B22F *1/00*

U.S. Cl. 419—42 **18 Claims**



1. In a process for producing compressed molded bodies from particulate material where the particulate material is in a capsule which is evacuated and the filled capsule subsequently is compressed in a pressure chamber by pressure applied via an operating medium, the improvement comprising:

using as the operating medium a flow die of soft metal, said pressure chamber being configured such that said flow die is partially expelled out of said pressure chamber during the application of pressure, thereby shaping said particulate material while simultaneously compressing the same.

4,599,216

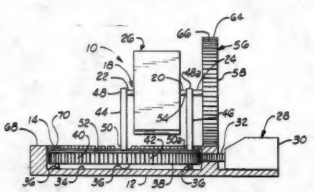
APPARATUS FOR EXPOSURE TO MICROWAVES

Michael D. Rohrer, Norman, and Ronald A. Bulard, Oklahoma City, both of Okla., assignors to Board of Regents for the University of Oklahoma, Norman, Okla.

Filed Nov. 21, 1983, Ser. No. 553,788

Int. Cl.⁴ A16L *2/00*; B01J *1/10*

U.S. Cl. 422—21 **21 Claims**



1. an apparatus for facilitating the exposure of substantially all surfaces of items to microwave irradiation to sterilize said items when said apparatus is disposed in a space and subjected to microwave irradiation from a source of microwave irradiation wherein the microwave irradiation energies varies within said space, the apparatus comprising:

a base;

a plate rotatably mounted on said base;

a spit turnably mounted on said plate a distance generally above said plate;

means for mounting said items upon said spit; and

means for rotating said plate in a plane while simultaneously turning the spit with said items mounted thereon to turn

said items in a plane angularly disposed with respect to the plane in which the plate is rotated, so the items to be sterilized are rotated in one plane by the plate being rotated in one plane or rotation and simultaneously turned in another plane which is angularly disposed with respect to the planar disposition of said first-mentioned plane by the turning of said split to substantially equalize the energies from the source of microwave irradiation to all surfaces of the items to be sterilized when said apparatus containing said items is disposed in said space and subjected to microwave irradiation with said space to sterilize said items.

18. A process for facilitating the exposure of substantially all surfaces of items to microwave irradiation to sterilize said items when said apparatus is disposed in a space and subjected to microwave irradiation from a source of microwave irradiation wherein the microwave irradiation energies vary within said space, utilizing an apparatus for containing the items to be sterilized wherein the apparatus is adapted to rotate the items in one plane and simultaneously turn the items in another plane angularly disposed with respect to the first-mentioned plane, the process comprising the steps of:

placing the items to be sterilized upon the apparatus;

placing the apparatus with the items to be sterilized placed thereon in said space; and

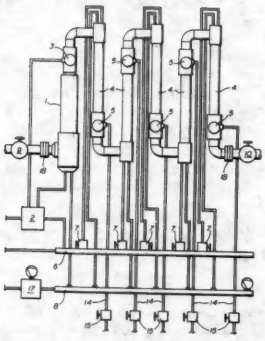
rotating the items to be sterilized utilizing said apparatus in one plane of rotation and simultaneously turning the items to be sterilized in another plane which is angularly disposed with respect to the first-mentioned plane while subjecting the items to be sterilized to microwave irradiation for a predetermined period of time to produce irradiated items, so the items to be sterilized are simultaneously rotated in one plane and in another plane which is angularly disposed with respect to the planar disposition of said first-mentioned plane to substantially equalize the energies from the source of microwave irradiation to all surfaces of the items to be sterilized when the apparatus containing said items is disposed in said space and subjected to microwave irradiation within said space to sterilize said items.

4,599,217

CORROSION SIMULATOR USEFUL FOR HEAT EXCHANGERS CONDENSING VAPORS CONTAINING WATER AND METHOD FOR USING SAME

William G. Winston, Houston, and David M. Groves, Huffman, both of Tex., assignors to Exxon Chemical Patents Inc., Florham Park, N.J.

Filed Jan. 22, 1985, Ser. No. 693,635
Int. Cl.[4] G01N *17/00*
U.S. Cl. 422—53 **12 Claims**



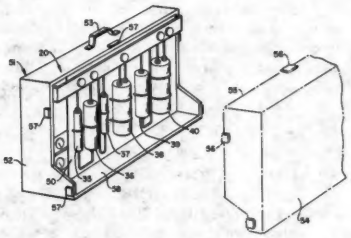
1. In industrial equipment having a vapor line to condensing and/or heat exchange equipment, a corrosion simulator for simulating and measuring the corrosion activity on the internal surfaces of said equipment, said simulator comprising more than one serially connected cooling-monitoring sections and associated with each thereof, means for monitoring corrosion rate and means for independently adjustably controlling the process stream cooling rate of each of said cooling-monitoring sections wherein the first of said serially connected cooling-monitoring sections has means to automatically control the temperature of the process stream therein.

4,599,218

CAPTURE BOX FOR PREDICTING HYDROCARBON POTENTIAL OF AN EARTH FORMATION UNDERLYING A BODY OF WATER

Gerard J. Demaison, Orinda, and Isaac R. Kaplan, Sherman Oaks, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 353,760, Mar. 1, 1982, abandoned. This application Apr. 13, 1984, Ser. No. 599,836
Int. Cl.[4] G01N *33/24*
U.S. Cl. 422—61 **2 Claims**



1. Portable capture box for on-site capture of the combustion product, carbon dioxide, of methane dissolved in a gas stream vacuum separated from a stream of water taken from a body of water at a known-on-site location by vacuum separator means aboard a vessel at the surface of said body of water so that accurate predictions of hydrocarbon potential of an earth formation underlying the body of water from which said methane was collected, can be made based on carbon isotope concentration in the carbon dioxide comprising:

a support box including a separately detachable side cover means adapted to be carried aboard said vessel in a transport mode, by carrying means attached to a wall of said support box, wherein a series of interconnected trapping, stripping and combustion stations each of which being of an elongated configuration, are fixedly attached at a central wall member of said box adjacent to but interior of closure surfaces formed between said box and said side cover means whereby said series of stations are protected from breakage during said transport mode, said support box also being capable of operating in an isotope capture mode after said side cover means has been detached from said support box wherein said box is placed atop a suitable horizontal support means on said vessel, said side cover means including releasable attaching means for disconnectably connecting said cover means to said box, said cover means also having elongated side, top and bottom walls extending from a front wall to define a storage compartment therein that extends about said series of stations for protection thereof during said transport mode but being easily releasable when isotope capture operation is contemplated wherein said series of stations attached to but facing outwardly from said central wall member of said support box, are exposed for easy servicing and viewing by a human operator,

valve means connectable to a separator means aboard said vessel so that said operator can connect said series of stations thereto in said isotope capture mode wherein

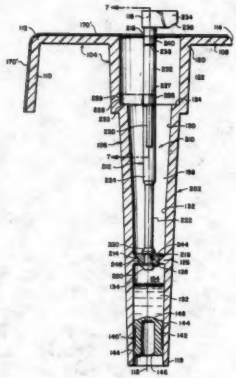
said gas stream from said separator means is serially directed through said series of stations in a continuous flow pattern for selective stripping and combusting of said methane to carbon dioxide and capturing of said carbon dioxide, without substantial operator intervention, said stations each having an inlet and an outlet and in combination including a first tube packed with absorbent material for water vapor and carbon dioxide and a first oxidation furnace located adjacent thereto for converting carbon monoxide to carbon dioxide, said first tube having its outlet connected to the inlet of said first oxidation furnace, a second tube packed with absorbent material for carbon dioxide having its inlet connected to the outlet of said first oxidation furnace, a first capture tube filled with glass beads at dry ice temperature for removal of lower-, mid- and high-range molecular weight hydrocarbons having its inlet connected to the outlet of said second tube packed with absorbent material, a second furnace having for converting methane to carbon dioxide, said furnace having its inlet connected to the outlet of said first capture tube and a second capture tube also filled with glass beads at dry ice temperature for trapping carbon dioxide having its inlet connected to the outlet of said second furnace whereby said stations provide trapping, stripping and combustion of said stream of gas passing through said stations in sinusoidal flow pattern during said isotope capture mode.

4,599,219

COAGULATION DETECTION BY PLUNGER SENSING TECHNIQUE

Daniel Cooper, Parker, and Jacqueline J. Jackson, Denver, both of Colo., assignors to Hemotec, Inc., Englewood, Colo.

Filed Oct. 15, 1982, Ser. No. 434,718
Int. Cl.[4] G01N *33/86*
U.S. Cl. 422—61 **68 Claims**



1. A cartridge in which to conduct a coagulation-related analytical test on fluid, comprising:

a tube-like member having an open interior extending generally axially therethrough from an open lower end to an upper end;

a partition of the tube-like member located within the open interior at a position intermediate the upper and lower ends of the tube-like member, said partition generally dividing the open interior into a lower chamber between the partition and the lower end and into an upper chamber between the partition and the upper end;

a passageway defined by and extending through the partition to allow fluid communication between the lower chamber and the upper chamber;

a plug member extending across the open interior of the lower chamber and sealing the open end of the lower chamber at a position spaced from the partition;

means for initially sealing the passageway to fluid communication therethrough and for subsequently selectively opening the passageway to fluid communication therethrough; and

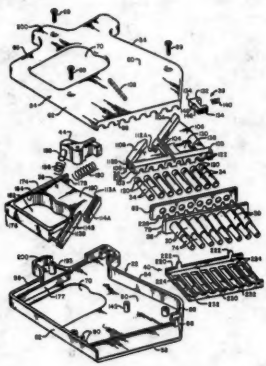
a plunger assembly extending into the upper chamber, said plunger assembly adapted to be reciprocated within the tube-like member and includes means by which to operatively contact and move said plunger assembly in a generally axial direction while permitting descent by force of gravity during analytical test.

4,599,220

MULTI-CHANNEL PIPETTER

Edward H. Yonkers, 16 Walnut St., Watertown, Mass. 02172, and James Ryan, 38 Satuit Trail, Scituate, Mass. 02066

Continuation of Ser. No. 348,876, Feb. 16, 1982, abandoned. This application Aug. 7, 1984, Ser. No. 638,503
Int. Cl.[4] B01L *3/02*
U.S. Cl. 422—100 **18 Claims**



6. A multi-channel pipetter comprising:

a case,

a plurality of cylinders in the case with their axes parallel to one another,

a piston plate movably mounted in the case and carrying a plurality of pistons that reciprocate in the cylinders upon reciprocation of the plate,

a finger actuated slide movably mounted on the case at an angle to the path of motion of the piston plate,

and inclined surfaces on the slide and piston plate and engaging one another causing movement of the slide to move the pistons in the cylinders.

4,599,221

RECOVERY OF URANIUM FROM WET PROCESS PHOSPHORIC ACID BY LIQUID-SOLID ION EXCHANGE

Zvi Ketzinel; Ygal Volkman, and Moshe Hassid, all of Beer-Sheva, Israel, assignors to The State of Israel, Atomic Energy Commission, Nuclear Research Center Negev, Israel

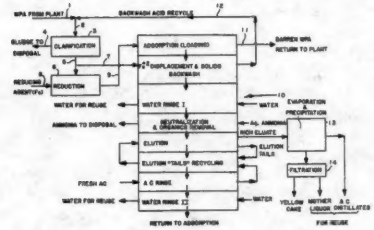
Filed Feb. 13, 1984, Ser. No. 579,544
Claims priority, application Israel, Aug. 1, 1983, 69384
Int. Cl.[4] B01D *15/04;* C01G *43/00*
U.S. Cl. 423—7 **4 Claims**

1. A process for the recovery of uranium from crude wet

process phosphoric acid (WPA) by cation exchange using as cation exchanger a resin comprising active amino phosphonic or hydroxy phosphonic groups linked to a matrix, which process comprises:

(i) subjecting crude WPA to a reduction treatment thereby to reduce uranium from the hexavalent into the tetravalent state;

(ii) contacting the so-reduced crude WPA with said cation exchange resin thereby to load the latter with tetravalent uranium;



(iii) subjecting the so-loaded cation exchange resin to a treatment by which Fe^{+2} is displaced from the resin;

(iv) thereafter subjecting the loaded resin to treatment with aqueous ammonia thereby to neutralize free acid groups present on said cation exchange resin and remove any organic matter;

(v) eluting the neutralized loaded cation exchange resin with an aqueous solution of a mixture of carbonate and bicarbonate of ammonium or an alkali metal salt; and

(vi) precipitating a uranium product from the resulting eluate.

4,599,222

RECOVERY OF TUNGSTEN AND RHENIUM

Alan D. Douglas; Martin B. MacInnis, and Kenneth T. Reilly, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 29, 1985, Ser. No. 728,649
Int. Cl.[4] C01G *41/00, 47/00*
U.S. Cl. 423—49 **18 Claims**

1. A process for recovering tungsten and rhenium from a relatively impure tungsten and rhenium solution, said process comprising:

(a) adjusting the pH of said relatively impure solution to from about 9.0 to about 10.0 to precipitate impurities contained therein and form a purified tungsten and rhenium solution, the pH adjustment from a value below about 9.0 being done with a base, and from a value above about 10.0 being done with a mineral acid;

(b) separating said impurities from the purified solution;

(c) adjusting the pH of the purified solution to from about 0.5 to about 7.0 with a mineral acid;

(d) adding to the pH adjusted purified solution a solution containing suffieicnt hexamine to subsequently form a first hexamine tungsten solid containing the major portion of the tungsten, the hexamine solution being at essentially the same pH as that of said pH adjusted purified solution;

(e) agitating the resulting hexamine-tungsten-rhenium mixture at a sufficiently low temperature and for a sufficient time to form a first hexamine tungsten solid containing the major portion of the tungsten and a first mother liquor containing the major portion of the rhenium; and

(f) separating said first solid from said first mother liquor.

4,599,223

SEPARATION OF TUNGSTEN FROM RHENIUM

Alan D. Douglas; Kenneth T. Reilly; Martin B. MacInnis, all of Towanda; John A. Powers, New Albany, and James N. Christini, Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 28, 1985, Ser. No. 737,758
Int. Cl.[4] C01G *41/00, 47/00*
U.S. Cl. 423—49 **5 Claims**

1. A process for separating tungsten from a solution containing tungstate and perrhenate ions, said process comprising:

(a) reacting hydrochloric acid with said solution at a temperature of at least about 85° C. to form a solid containing essentially all of the tungsten and a liquor containing essentially all of the rhenium, the amount of said hydrochloric acid being sufficient to enable said liquor to be at least about 1.25 normal in hydrochloric acid after said solid has formed; and

(b) separating said solid from said liquor.

4,599,224

RECOVERY OF MOLYBDENUM FROM MOLYBDENUM DISULFIDE

Clarence D. Vanderpool, and Martin B. MacInnis, both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 679,418, Dec. 7, 1984. This application Aug. 22, 1985, Ser. No. 768,376
Int. Cl.[4] C01G *39/02*
U.S. Cl. 423—606 **9 Claims**

1. A process for recovering molybdenum from molybdenum disulfide, said process comprising:

(a) forming a slurry of said molybdenum disulfide in a solution of an alkali metal hydroxide, the amount of alkali metal hydroxide being sufficient to react with at least a portion of the molybdenum disulfide to form an alkali metal molybdate and an alkali sulfate;

(b) heating said slurry in an oxidizing atmosphere at an elevated temperature and pressure and for a sufficient time to convert at least a portion of the molybdenum disulfide to the alkali metal molybdate and provide a pregnant liquor of the alkali metal molybdate and a residue;

(c) separating said pregnant liquor from the residue;

(d) adding a sufficient amount of a hexamine to said pregnant liquor to form an hexamine-molybdenum compound containing the major portion of the molybdenum which is in said pregnant liquor;

(e) adjusting the pH of the resulting hexamine-treated pregnant liquor to from about 1.5 to about 3.8 to precipitate the major portion of said hexamine-molybdenum compound; and

(f) separating said hexamine-molybdenum compound from the resulting mother liquor.

8. A process according to claim 1 wherein said hexamine-molybdenum compound is heated at a sufficient temperature for a sufficient time to form molybdenum trioxide.

4,599,225

CONTINUOUS FLOW SEPARATION WITH MOVING BOUNDARY SORPTION

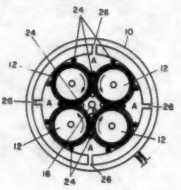
Leland C. Dickey, Omaha, Nebr., assignor to InterNorth, Inc., Omaha, Nebr.

Continuation of Ser. No. 561,899, Dec. 15, 1983, abandoned. This application Jul. 5, 1985, Ser. No. 752,097
The portion of the term of this patent subsequent to Oct. 22, 2002, has been disclaimed.
Int. Cl.[4] B01D *15/02, 15/08*
U.S. Cl. 423—659 **4 Claims**

1. A continuous process for separating components of a fluid mixture which comprises:

(a) forming a sorption zone and a desorption zone, said zones being separated by a boundary of a sorbent material which

is disposed on the outside of a plurality of rotating elements and which continuously moves back and forth between the zones, said boundary forming a seal between the zones and said sorbent material or support for the sorbent material being deformable to provide an acceptable seal,



(b) causing a fluid mixture to flow into the sorption zone wherein the conditions are such to promote sorption of one of the components of the mixture by the sorbent material, and

(c) creating conditions in the desorption zone such that the sorbed component will be desorbed when the sorbent material containing the sorbed component moves into the desorption zone.

4,599,226

WOUND DRESSING COMPRISING SILVER SULFADIAZINE INCORPORATED IN ANIMAL TISSUE AND METHOD OF PREPARATION

Charles L. Fox, Jr., Sherman, Conn.; Shanta M. Modak, River Edge, N.J., and Paul Fox, Valhalla, N.Y., assignors to Genetic Laboratories, Inc., St. Paul, Minn.

Division of Ser. No. 480,687, Mar. 31, 1983, Pat. No. 4,446,124. This application Mar. 1, 1984, Ser. No. 585,294

Int. Cl.[4] A61K *9/70, 35/12*

U.S. Cl. 424—27 **10 Claims**

1. A method for preparing animal tissue for use as burn or wound dressings comprising soaking animal tissue in an aqueous solution containing soluble sulfadiazine, so as to incorporate sulfadiazine in said tissue, soaking the sulfadiazine incorporated tissue in a solution containing silver nitrate under conditions causing in situ formation of silver sulfadiazine in said tissue, and then rinsing and partially drying the silver sulfadiazine incorporated tissue.

4,599,227

INJECTABLE PHARMACEUTICAL PREPARATION FOR THE INDUCTION OF MULTIPLE FOLLICULAR GROWTH

H. Craig Dees, Oregon, and Ronald D. Schultz, Verona, both of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Nov. 7, 1983, Ser. No. 549,666

Int. Cl.[4] A61K *9/42;* **C07K** *7/10*

U.S. Cl. 424—38 **17 Claims**

1. An injectable pharmaceutical preparation for the induction of multiple follicular growth in mammals comprising an effective amount of a superovulation inducing hormone selected form the group consisting of follicle stimulating hormone and pregnant mare serum gonadotropin, the hormone being in aqueous solution which is encapsulated within liposomes having the following characteristics: when encapsulating the hormone and injected into cows five days prior to estrus, the liposomes produce multiple follicular development as monitorable by rectal palpation of the ovaries.

4,599,228

ANTIMICROBIAL AGENT

Peter A. Ladanyi, Fort Collins, Colo., assignor to Vipont Laboratories, Inc., Fort Collins, Colo.

Continuation of Ser. No. 226,088, Jan. 19, 1981, abandoned, which is a continuation-in-part of Ser. No. 151,706, May 20, 1980, abandoned, which is a continuation-in-part of Ser. No. 24,604, Mar. 28, 1979, abandoned. This application Jan. 25, 1984, Ser. No. 573,044

Int. Cl.[4] A61K *7/18, 7/26*

U.S. Cl. 424—52 **12 Claims**

1. A method for treating dental caries in humans comprising applying to the affected area an effective amount of a composition comprising from about 0.1% to 20% by weight of a non-toxic sanguinarine salt, from about 1% to about 60% by weight of zinc chloride, and from about 0.4% to about 3.0% by weight of a non-toxic fluoride salt, in a solvent selected from the group consisting of water, glycerine, propylene glycol, dimethyl sulfoxide, and C1–C6 alcohols.

4,599,229

METHOD OF PROMOTING ANIMAL GROWTH USING ANTIBODIES AGAINST SOMATOSTATIN

Maria-Luisa Maccecchini, Northbrook, Ill., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Sep. 9, 1985, Ser. No. 773,814

Int. Cl.[4] A61K *39/395*

U.S. Cl. 424—85 **10 Claims**

1. A method of enhancing the rate of growth of an animal which comprises administering to said animal growth-enhancing amounts of antibodies against somatostatin.

4,599,230

SYNTHETIC HEPATITIS B VIRUS VACCINE INCLUDING BOTH T CELL AND B CELL DETERMINANTS

David R. Milich, San Diego, and Frank V. Chisari, Del Mar, both of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Filed Mar. 9, 1984, Ser. No. 588,122

Int. Cl.[4] A61K *39/29;* **C07K** *7/06, 7/08, 7/10*

U.S. Cl. 424—89 **19 Claims**

1. A vaccine against infection by hepatitis B virus comprising:

(a) an effective amount of a synthetic polypeptide having an amino acid residue sequence taken from left to right and in the direction from amino-terminus to carboxy-terminus, and represented by the formula:

ThrLysProSerAspGlyAsnCysThrCysIleProIleProSer;

(b) an effective amount of at least one synthetic polypeptide having an amino acid residue sequence taken from left to right and in the direction from amino-terminus to carboxy-terminus selected from the group consisting of: PheProGlySerSerThrThrSerThrGlyProCysArgThrCys MetThrThrAlaGlnGlyThrSerMetTyrProSerCys; MetThrThrAlaGlnGlyThrSerMetTyrProSerCys; IleProGlySerThrThrThrSerThrGlyProCysLysThrCys ThrThrProAlaGlnGlyAsnSerMetPheProSerCys; ThrThrProAlaGlnGlyAsnSerMetPheProSerCys; and CysProLeuIleProGlySerThrThrThrSerThrGlyPro CysLysThrCysThrThrProAlaGlnGlyAsnSerMet PheProSerCys; and

(c) a physiologically tolerable diluent,

said vaccine when introduced into a host, being capable of inducing the production of antibodies and the proliferation of thymus-derived cells in the host, said antibodies immunoreacting with said hepatitis B virus, and said vaccine protecting the host from hepatitis B viral infection.

4,599,231

SYNTHETIC HEPATITIS B VIRUS VACCINE INCLUDING BOTH T CELL AND B CELL DETERMINANTS

David R. Milich, San Diego, and Frank V. Chisari, Del Mar, both of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Filed Mar. 9, 1984, Ser. No. 587,983

Int. Cl.[4] A61K *39/29*; C07K *7/06, 7/08, 7/10*

U.S. Cl. 424—89 22 Claims

1. A vaccine against infection by hepatitis B virus comprising:

(a) an effective amount of at least one synthetic polypeptide having an amino acid residue sequence taken from left to right and in the direction from amino-terminus to carboxy-terminus selected from the group consisting of: SerLeuAsnPheLeuGlyGlyThrThrValCysLeuGlyGlnAsn; ValCysLeuGlyGlnAsn; CysLeuGlyGlnAsnSerGlnSerProThrSerAsnHis SerProThrSerCysProProThrCysProGlyTyr ArgTrpMetCysLeuArgArgPheIle; and LeuValLeuLeuAspTyrGlnGlyMetLeuProValCysProLeu;

(b) an effective amount of at least one synthetic polypeptide having an amino acid residue sequence taken from left to right and in the direction from amino-terminus to carboxy-terminus selected from the group consisting of: PheProGlySerSerThrThrSerThrGlyProCysArgThrCys MetThrThrAlaGlnGlyThrSerMetTyrProSerCys; MetThrThrAlaGlnGlyThrSerMetTyrProSerCys; IleProGlySerThrThrThrSerThrGlyProCysLysThrCys ThrThrProAlaGlnGlyAsnSerMetPheProSerCys; ThrThrProAlaGlnGlyAsnSerMetPheProSerCys; and CysProLeuIleProGlySerThrThrThrSerThrGlyPro CysLysThrCysThrThrProAlaGlnGlyAsnSerMet PheProSerCys; and

(c) a physiologically tolerable diluent,

said vaccine when introduced into a host, being capable of inducing the production of antibodies and the proliferation of thymus-derived cells in the host, said antibodies immunoreacting with said hepatitis B virus, and said vaccine protecting the host from hepatitis B viral infection.

4,599,232

PHARMACEUTICAL COMPOSITION WITH METABOLIC AND ENERGETIC ACTIVITY FOR THE USE IN CARDIAC AND VASCULAR THERAPY

Alberto Bertelli, Milan, Italy, assignor to Sigma Tau Industrie Faramaceutiche Riunite S.p.A., Rome, Italy

Filed Feb. 9, 1984, Ser. No. 578,588

Claims priority, application Switzerland, Feb. 16, 1983, 858/83

Int. Cl.[4] A61K *37/48, 31/205*

U.S. Cl. 424—94 4 Claims

1. A pharmaceutical composition having metabolic antianoxic activity containing as the principal active ingredient an antianoxic effective amount of a combination comprising the components Coenzyme Q_{10} and a quaternary ammonium compound selected from carnitine and acetylcarnitine in admixture with a pharmaceutically acceptable carrier, said components being in a synergistic antianoxic active ratio.

4,599,233

AGRICULTURAL AND HORTICULTURAL FUNGICIDE AND FRUIT STORAGE DISEASE PREVENTING AGENT AND PROCESS FOR PRODUCTION THEREOF

Tomomasa Misato, Tokyo; Yasuo Homma, Sakado; Yutaka Arimoto, Urawa; Tohoru Hidaka, Ichikawa, and Mitsuhara Yuda, Hirakata, all of Japan, assignors to Rikagaku Kenkyusho, Wako; Riken Vitamin Oil Co., Ltd. and Hodogaya Chemical Co., Ltd., both of Tokyo, all of, Japan

Continuation of Ser. No. 514,850, Jul. 18, 1983, abandoned, which is a continuation of Ser. No. 378,502, May 17, 1982, abandoned, which is a continuation of Ser. No. 223,708, Jan. 9, 1981, abandoned, which is a continuation of Ser. No. 55,553, Jul. 9, 1979, abandoned. This application Dec. 12, 1984, Ser. No. 680,815

Claims priority, application Japan, Jul. 13, 1978, 53-85326

Int. Cl.[4] A01N *59/00*

U.S. Cl. 424—127 12 Claims

1. An agricultural and horticultural fungicide and fruit storage disease preventing composition, which comprises a fungicidally effective amount of sodium bicarbonate, a food emulsifier and 0–90% based on the total weight of the composition of at least one food compatible carrier, wherein said food emulsifier is at least one member selected from the group consisting of fatty acid glycerol esters, fatty acid sucrose esters, fatty acid sorbitan esters and derivatives thereof, fatty acid propyleneglycol esters and lecithin and wherein the mixing ratio of sodium bicarbonate to said food emulsifier is 1:1 to 20:1 by weight.

4,599,234

SYNERGISTIC DIET COMPRISING SELENIUM BASED COMPOUNDS

M. Samir Amer, 155 North St., Greenwich, Conn. 06830

Filed Oct. 7, 1983, Ser. No. 539,863

Int. Cl.[4] A61K *33/04, 31/07, 31/05*

U.S. Cl. 424—164 4 Claims

1. A synergistic diet for negating the effect of chemical carcinogens in lower animals comprising, by weight of the diet,

(a) about 1% of a non-toxic source of selenium;

(b) about 0.5% of butylated hydroxytoluene, and

(c) about 0.05% of β-carotene.

4,599,235

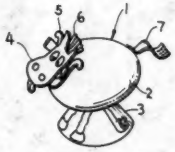
MANUFACTURE OF DECORATED OVOID FIGURINES

Jack V. Miller, and Ruth E. Miller, both of 700 N. Auburn Ave., Sierra Madre, Calif. 91024

Filed Mar. 15, 1985, Ser. No. 712,161

Int. Cl.[4] A23L *1/27*

U.S. Cl. 426—250 22 Claims



1. A method for producing a decorated ovoid figurine consisting of the steps of:

(a) providing an ovoid body in an edible, egg-shaped form;

(b) providing a base including at least one truncated cone having a large bottom end and a small top end, fabricated of a decorative sheet material;

(c) bonding the small end of the truncated cone to the surface of the ovoid, using a suitable bonding means;

(d) providing cut shapes of decorative sheet material; and

(e) bonding the cut shapes to the surface of the ovoid to form figurine features, using a suitable bonding means.

5. A method for producing a decorated ovoid figurine according to claim 1, 2, 3 or 4 in which the ovoid body is colored.

4,599,236

METHOD OF PROCESSING UNSHELLED NUTS

Graeme C. Mudford, and Robyn J. Mudford, both of 9 George Street, Ferntree Gully, Victoria 3156, Australia

Filed Apr. 8, 1985, Ser. No. 720,910
Claims priority, application Australia, Apr. 13, 1984, PG4570
Int. Cl.[4] A23L *1/36*
U.S. Cl. 426—456 13 Claims

1. A process for drying unshelled nuts, said process including the first step of subjecting the nuts to a very high humidity at a temperature above normal room temperature, the second step of then subjecting the nuts to a relatively low humidity whilst maintaining the temperature above normal room temperature for a period of time sufficient to facilitate cracking of the shells of said nuts, and the third step of increasing said temperature and further reducing said humidity to facilitate removal of moisture until the nuts have been dried to a desired exent, said temperature above normal room temperature not exceeding 50° C.

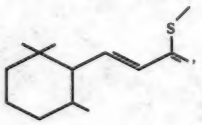
4,599,237

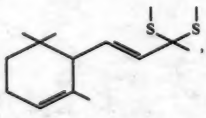
FLAVORING WITH METHYLTHIOIONENE DERIVATIVES

Alan O. Pittet, Atlantic Highlands; Ranya Muralidhara, Fair Haven; Manfred H. Vock, Locust; Kevin P. Miller, Middletown, and Domenick Luccarelli, Jr., Neptune, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

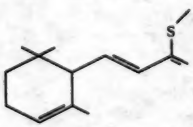
Filed Aug. 23, 1985, Ser. No. 768,726
Int. Cl.[4] A23L *1/226, 1/235*
U.S. Cl. 426—535 4 Claims

1. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of adding to said foodstuff of from 0.02 ppm up to about 50 ppm by weight based on the total foodstuff of a methylthioionene derivative having the structure selected from the group consisting of





, and



4,599,238

PROCESS FOR PREPARING BOILED NOODLES

Hiroshi Saitoh; Katsuyuki Kadooka; Mamoru Tsukamoto, all of Utsunomiya; Shoji Ono, Tatebayashi, and Masaki Ohkawa, Tokyo, all of Japan, assignors to Ma-Ma Macaroni Co., Ltd., Japan

Continuation of Ser. No. 523,892, Aug. 15, 1983, Pat. No. 4,552,772, which is a continuation of Ser. No. 312,259, Oct. 13, 1981, abandoned. This application Jun. 24, 1985, Ser. No. 748,025
Claims priority, application Japan, Jun. 12, 1981, 56-91424
The portion of the term of this patent subsequent to Nov. 25, 2002, has been disclaimed.
Int. Cl.[4] A23L *1/16*
U.S. Cl. 426—557 3 Claims

1. Cooked wheat-flour based pastas ready for rapid cooking prepared by boiling said pastas and washing said boiled pastas with water, the improvement which comprises immersing the boiled pastas in an aqueous solution containing (a) at least one of citric acid and lactic acid and (b) table salt, then packaging and heat sterilizing the pastas which have been immersed, said aqueous solution having a pH such that the pH of the boiled pastas, after immersion, is about 3.9 to about 4.3.

4,599,239

METHOD OF PREPARING NONALCOHOLIC BEVERAGES STARTING WITH A DEAERATED LOW SUGAR CONCENTRATION BASE

Dieter Wieland; Hartmut Meinert, both of Dusseldorf, and Hans-Ulrich Pohl, Essen, all of Fed. Rep. of Germany, assignors to Die Firma Follpack Dipl Brauerei-ing Dieter Wieland, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 28, 1983, Ser. No. 508,751
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1982, 3224706
Int. Cl.[4] A23L *2/00, 2/26, 2/32;* G01N *33/14*
U.S. Cl. 426—590 8 Claims

1. A process for preparing a nonalcoholic beverage comprising the steps of:

A. preparing a sugar solution consisting essentially of powdered or liquid sugar dissolved in deaerated water wherein said solution has an oxygen content below 0.15 mg/l sugar and a sugar concentration of 7° to 20° Brix;

B. adjusting the concentration of oxygen in the resultant sugar solution to less than 0.1 mg/l by deaerating the same; and

C. adding flavoring material or additives to the deaerated sugar solution.

4,599,240

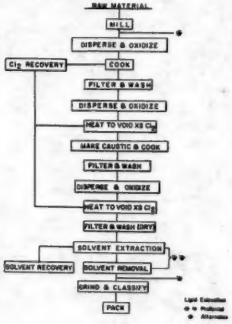
CELLULOSE FOOD PRODUCT AND PRODUCTS RESULTING THEREFROM

Jerome B. Thompson, Box 231 - Rte. 3, Cumberland, Md. 21502

Division of Ser. No. 330,957, Dec. 15, 1981, Pat. No. 4,486,459, which is a continuation-in-part of Ser. No. 97,348, Nov. 26, 1979, Pat. No. 4,307,121. This application Sep. 21, 1983, Ser. No. 534,209
Int. Cl.[4] A23L *1/20*
U.S. Cl. 426—634 6 Claims

1. The purified short fiber cellulose product from the hulls of edible legumes and suitable for human consumption produced by the process comprising oxidizing the particulate, relatively non-ligneous lipid-free legume hulls in a particulate state in a water slurry with chlorine, cooking said slurry at a temperature and for a time sufficient to solubilize the greater amount of non-cellulose material present in the legume hulls, separating the formed pulp therefrom, redispersing the pulp in water to form a further slurry and oxidizing same with chlorine, heating the oxidized slurry at a temperature sufficient to remove free chlorine, adding sodium hydroxide to render the slurry strongly basic and cooking the basic slurry at a temperature and for a time sufficient to digest non-cellulosic material pres-

ent therein, separating the pulp therefrom, reslurrying the pulp in water and oxidizing same with chlorine, heating the slurry at a temperature sufficient to remove excess chlorine, reseparating the pulp therefrom, extracting the water-moist pulp with an excess of a water miscible solvent and drying the moist pulp



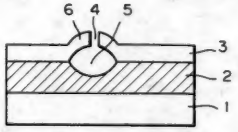
to produce a dried pulp product of substantially pure cellulose which may be ground to produce an edible cellulose powder product, said cellulose product being characterized by having a configuration, when in a powdered state and under an electron microscope magnification, generally resembling a log and with the product particles being generally regular in size.

4,599,241

METHOD FOR INSPECTING DEFECTS OF THIN MATERIAL FILM

Hiroshi Nakaboh, and Ken Ogura, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1984, Ser. No. 683,202
Claims priority, application Japan, Dec. 28, 1983, 58-245228
Int. Cl.[4] B05D *5/12;* **H01L** *21/66*
U.S. Cl. 427—8 **4 Claims**



1. A method for inspecting defects of a thin material film for the use in the manufacture of a semiconductor device comprising the steps of:

forming on a semiconductor substrate a reactive material film which can gasify through a chemical reaction with a reactive solution;

forming on a surface of said reactive material film a thin material film to be tested which is chemically resistant to said reactive solution;

immersing the structure obtained by said steps into said reactive solution so as to react with said reactive material film through any pinholes present in the test materials to form pimples on the exposed surface of the test material film; and

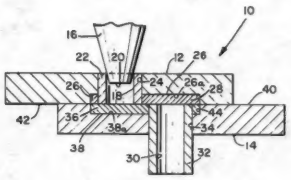
counting the number of pimples of said test material film which are formed by a reactive gas, said reactive gas being produced through the chemical reaction between said reactive material film and said reactive solution so as to lift said test material film around pinholes therein, thereby determining the number of pinholes in the film, based on the number of pimples formed.

4,599,242

REFRACTORY SLIDEGATE WITH COUNTERSUNK HOLE AND METHOD

Arnold S. Brooker, and Jay F. Schnackel, both of Whitehouse, Ohio, assignors to Plasmafusion, Inc., Wyandotte, Mich.

Division of Ser. No. 533,515, Sep. 19, 1983. This application Mar. 12, 1985, Ser. No. 711,048
Int. Cl.[4] B05D *1/08*
U.S. Cl. 427—34 **10 Claims**



1. A method of producing a slidegate for a slidegate assembly for regulating the flow of molten melt comprising the steps of:

providing a slidegate having a substantially planar surface and an opening extending therethrough,

countersinking a recess in the planar surface about the opening, said recess having a bottom surface,

inserting a sleeve member of refractory material in the slidegate opening, said sleeve member extending through the slidegate and above the recess bottom surface, and

spraying an insert of a refractory material in the recess around the sleeve member to substantially completely fill the recess,

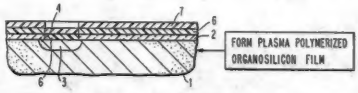
the insert and sleeve member having upper surfaces that are substantially coplanar with said planar surface.

4,599,243

USE OF PLASMA POLYMERIZED ORGANOSILICON FILMS IN FABRICATION OF LIFT-OFF MASKS

Harbans S. Sachdev, and Krishna G. Sachdev, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 452,549, Dec. 23, 1982, Pat. No. 4,493,855. This application Nov. 5, 1984, Ser. No. 668,361
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—38 **29 Claims**



1. A lift-off method for forming a pattern on a substrate, comprising:

A. blanket depositing a first film of a solvent soluble organic polymer on said substrate;

B. plasma polymerizing on said first film a second oxygen barrier film of an organosilicon polymer from an ambient containing monomers selected from the group consisting of organosilicones, organosilanes, organosilazanes, organosiloxanes and mixtures thereof said organosilicon polymer having the characteristic that it does not contain a preponderance of Si—O bonds relative to the number of Si—CH_3 bonds;

C. forming a pattern of selected openings through said barrier film to expose corresponding portions of said first film; and

D. reactive ion etching said exposed portions of said first

film in an oxygen containing ambient to form openings therein and extending therethrough to expose corresponding portions of said substrate.

4,599,244

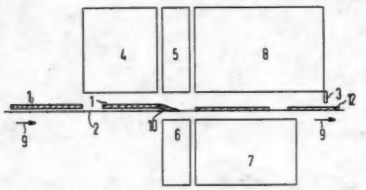
METHOD LARGE-AREA SILICON BODIES

Richard Falckenberg, Wald; Christa Grabmaier, and Josef Grabmaier, both of Berg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 629,677, Jul. 11, 1984, abandoned. This application Sep. 12, 1984, Ser. No. 649,658

Int. Cl.[4] B05D *5/12, 3/02;* H01L *31/00*

U.S. Cl. 427—74 18 Claims



1. A method for manufacture of polycrystalline, large-area silicon bodies adapted for further processing into solar cells, said method comprising the sequented steps of:

(a) depositing on surface portions of a horizontally oriented net-like structure preformed silicon in a plate-like form, said net-like structure being

(a) resistant to molten silicon, and

(b) wettable by molten silicon,

(b) heating the resulting assembly of said net-like structure and said preformed silicon to a temperature sufficient to melt said silicon, and

(c) crystallizing the resulting melted silicon in said net-like structure.

4,599,245

METHOD FOR MAKING LARGE-SURFACE SILICON CRYSTAL BODIES

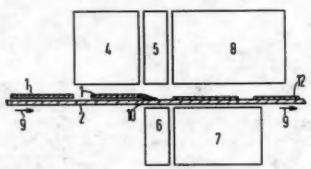
Richard Falckenberg, Wald; Christa Grabmaier, and Josef Grabmaier, both of Berg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 11, 1984, Ser. No. 649,311

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1983, 3338335

Int. Cl.[4] B05D *3/02, 5/12;* H01L *31/00*

U.S. Cl. 427—74 18 Claims



1. A method for manufacture of large-area silicon crystal bodies adapted for further processing into solar cells, comprising the sequential steps of:

(a) depositing on surface portions of a horizontally oriented, net-like structure preformed silicon bodies having a plate-like form, said net-like structure being

(a) resistant to molten silicon, and

(b) substantailly not wettable by molten silicon, said silicon bodies each having

(1) dimensions which approximate those, less anticipated shrinkage from melting, of the desired product silicon crystal bodies, and

(2) dimensions which are generally larger than the average individual mesh size existing in said netlike structure.

(b) heating the resulting assembly of said net-like structure with said silicon bodies deposited thereon to a temperature sufficient to melt said silicon, and

(c) crystallizing the so-melted silicon on said net-like structure to produce said silicon crystal bodies.

4,599,246

METHOD OF PRODUCING LIQUID-CRYSTAL DISPLAY DEVICE

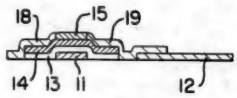
Toshihiko Harajiri; Shunichi Motte, and Masafumi Shinbo, all of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Oct. 29, 1984, Ser. No. 665,774

Claims priority, application Japan, Nov. 7, 1983, 58-208477

Int. Cl.[4] B05D *5/12*

U.S. Cl. 427—86 4 Claims



1. A method of producing a thin film transistor array for a liquid-crystal display device, comprising the steps of:

depositing a transparent conductive film over a substrate;

forming a picture element electrode and a gate electrode from said transparent conductive film in a first masking step;

depositing in sequence a gate insulator film, a thin semiconductor film and at least one opaque insulator film;

forming selectively said gate insulator film, said thin semiconductor film and said opaque insulator film in a pattern so that at least a portion of said gate electrode is covered, in a second masking step;

opening up a resist over source and drain regions of said thin semiconductor film and the resist over a contact portion of said picture element electrode in a third masking step, and then exposing the source and drain regions of said thin semiconductor film by etching said opaque insulator film; and

depositing a metal electrode layer while said resist is still attached, and then removing said resist so as to pattern said metal electrode layer.

4,599,247

SEMICONDUCTOR PROCESSING FACILITY FOR PROVIDING ENHANCED OXIDATION RATE

Kenneth E. Bean, Richardson; Robert H. Havemann, Garland, and Andrew Lane, Westminster, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 4, 1985, Ser. No. 688,771

Int. Cl.[4] B05D *5/12;* C23C *16/00*

U.S. Cl. 427—93 19 Claims

1. A method of thermally oxidizing a silicon member comprising:

(a) providing an hermetic quartz tube capable of withstanding pressures therein of from 1 to about 20 atmospheres, as the only pressurized vessel,

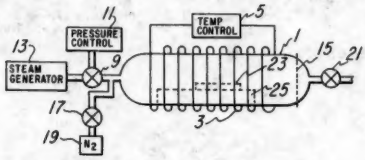
(b) placing a semiconductor member in said tube;

(c) out-gassing and sealing said tube;

(d) heating the interior of said tube to a predetermined temperature above the boiling point of steam therein at a

predetermined super atmospheric pressure while maintaining the exterior of said tube at atmospheric pressure;

(e) placing steam in said tube at said super atmospheric pressure after said boiling point temperature has been reached;



(f) maintaining said predetermined pressure and predetermined temperature in said tube for a predetermined time period;

(g) cooling the interior of said tube; and

(h) lowering the pressure in said tube.

4,599,248

METHOD FOR APPLYING EMULSION ONTO SCREEN PRINTING PLATE

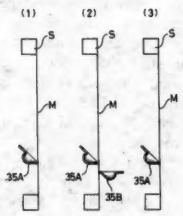
Kenji Shirataki, Kita, Japan, assigaor to Tokai Shoji Co. Ltd., Tokyo, Japan

Division of Ser. No. 624,060, Jun. 25, 1984, Pat. No. 4,509,455. This application Nov. 21, 1984, Ser. No. 673,884

Claims priority, application Japan, Aug. 27, 1983, 58-156776

Int. Cl.[4] B05D *1/26, 1/42, 3/12*

U.S. Cl. 427—209 **3 Claims**



1. A method for applying an emulsion onto a screen printing plate by operating vertically movable squeegees arranged on either side of the screen which in turn is supported vertically on a base, which method comprises the seccessive steps of:

contacting one of the squeegees with one side of the screen for applying the emulsion;

contacting both of the squeegees with both sides of said screen, said one of said squeegees applying the emulsion onto said one side of the screen while the other squeegee recovers the emulsion thus applied from the opposite side of the screen by moving the squeegees vertically; and repeatedly applying the emulsion until the emulsion is urged through the screen from its said one side to its opposite side.

4,599,249

METHOD TO IMPROVE FLOW CHARACTERISTICS OF WATER INSOLUBLE SOLID PARTICLES AND COMPOSITION

Robert P. Bennett, Bridgewater, N.J., and Robert L. Sokolove, Lexington, Mass., assignors to Gus, Inc., Dallas, Tex.

Filed Dec. 12, 1984, Ser. No. 681,109

Int. Cl.[4] B05D *7/00;* **C08L** *1/08;* **C10L** *9/00, 10/00*

U.S. Cl. 427—220 **16 Claims**

1. A method of improving flow characteristics of water insoluble solid particles while inhibiting caking characteristics of the particles, comprising: causing the particles to flow from one location to another location; and applying an aqueous solution to the flowing particles, the aqueous solution including a water soluble polymer derived from cellulose in an amount sufficient to inhibit the caking characteristics of the particles.

4,599,250

FREEZE CONDITIONING AGENT FOR PARTICULATE SOLIDS

Virgil H. Cargle, Houston, Tex.; Max L. Robbins, South Orange, and Jan Bock, Bridgewater, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 19, 1982, Ser. No. 442,879

Int. Cl.[4] B05D *7/00;* **C09K** *3/18;* **C10L** *9/00, 10/00*

U.S. Cl. 427—220 **6 Claims**

1. A method for treating particulate solids having surface moisture which comprises the steps of: (a) spraying the particulate solids prior to exposure to a freezing environment with an effective amount of a blend of hydrophile and lipophile surfactants in a liquid hydrocarbon at a concentration of 1 to 50 weight percent which blend has the property of forming a homogenous microemulsion at 20° C. when added to water at the salinity of said surface moisture on the particulate solids to be sprayed and at a water to hydrocarbon ratio in the range between 99:1 and 85:15; and (b) forming a microemulsion by the resulting admixture of said blend and said surface moisture between said solids whereby the cohesive strength of such solids when frozen is reduced.

4,599,251

DECORATED ARTICLE, METHOD OF FABRICATING THE SAME AND SUBSTRATES USED IN CONNECTION THEREWITH

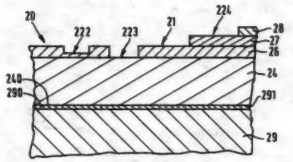
Gilbert Feller, Le Locle, Switzerland, assignor to Metalem S.A., Le Locle, Switzerland

Filed Jun. 18, 1984, Ser. No. 621,869

Claims priority, application France, Jun. 23, 1983, 83 10412

Int. Cl.[4] B32B *3/00, 9/04;* **B05D** *5/06*

U.S. Cl. 428—156 **22 Claims**



1. A decorated article comprising:

at least one surface which appears colored in reflected light;

said colored-appearing surface comprising a silicon substrate and an upper layer formed on and fixedly connected with the substrate;

said upper layer being pervious to optical light and comprising a solid silicon compound which is practically inert under standard conditions and which is selected from the group essentially consisting of silicon carbide, silicon dioxide, silicon nitride; and

said solid silicon compound possessing an interference-color producing thickness.

said upper layer has at a first surface region thereof a first thickness sufficient for forming an interference-color and at a second surface region thereof a second thickness which imparts optical properties to the second surface region which are sufficiently different from those of the first surface region for generating a contrast which can be discerned with human eye.

3. The decorated article as defined in claim 1, wherein: the upper layer possesses variable thickness.

4,599,252

METHOD OF MAKING A FIBROUS THERMALLY INSULATING LAYER OF COHERENT STRUCTURE, A LAYER MADE BY THIS METHOD, AND A THERMALLY INSULATING ELEMENT PROVIDED WITH SUCH A LAYER

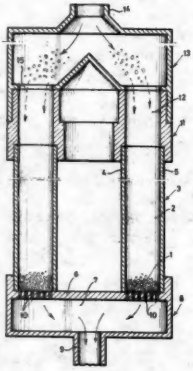
Hendricus W. M. van Hattem, Vlissingen, and Jules N. Isendam, Kesteren, both of Netherlands, assignors to Amgas B.V., Middelburg, Netherlands

Filed Sep. 21, 1983, Ser. No. 534,325

Claims priority, application Netherlands, Sep. 21, 1982, 8203647

Int. Cl.[4] B27N 5/02

U.S. Cl. 428—35 13 Claims



1. A method of making a fibrous, thermally insulating layer of coherent structure using an apparatus which includes a container having an interior and two opposite ends which are open; an outlet element having a perforated portion which covers a first of said two open ends of said container; and an inlet element which covers a second of said two open ends of said container, said inlet element including a channel which communicates with the interior of said container, said method comprising the steps of

providing a quantity fibrous particles which have rounded shapes,

combining said fibrous particles with a binder so as to form a fiber particle-binder mixture,

entraining said fiber particle-binder mixture in a gas stream, and

conveying said gas stream with said fiber particle-binder mixture entrained therein through the channel in said inlet element and into the interior of said container such that the fiber particle-binder mixture will deposit on said perforated portion of said second element and accumulate in the interior of said container until said container is completely filled with said fiber particle-binder mixture from its first end to its second end, thus producing said coherent structure.

4,599,253

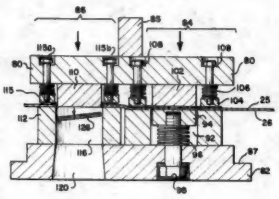
METHOD FOR MAKING DECORATIVE EMBLEMS AND THE LIKE AND SHAPES PREPARED BY THAT METHOD

Charles E. Bree, Delaware, Ohio, assignor to The D. L. Auld Company, Columbus, Ohio

Filed Sep. 14, 1981, Ser. No. 301,494

Int. Cl.[4] B32B 3/10, 7/12; B05D 3/12, 5/00

U.S. Cl. 428—40 9 Claims



1. In a method for producing decorative shapes which comprises flow coating a clear, viscous, fluent plastic onto the top surface of a horizontally supported substrate having a series of individual designs provided thereon, curing said fluent plastic and die cutting plastic coated shapes from said substrate contiguous with said designs; the improvement which comprises:

die cutting each of said shapes by application of a female cutting die to one surface of said substrate and a male punch to the other surface of said substrate, said female cutting die comprising a die cavity, a steel rule knife edge at the mouth of said die cavity, a pressure platform mounted in said cavity, and a resilient mounting means supporting said platform,

while die cutting said shape, holding said shape against the face of said punch with said platform, and

supplying sufficient force to said shape to prevent said shape from bowing.

9. A decorative shape comprising a laminate of:

a metal foil substrate having a top surface and a bottom surface,

an adhesive composition layer coated on said bottom surface of said substrate,

a protective sheet releasably laminated to said adhesive composition layer,

a graphic formed on the top surface of said substrate, and

a clear, weather-resistant layer of a polyurethane composition, said polyurethane layer being approximately 0.02 to 0.04 inch thick and being flow coated over said graphic, said shape being essentially flat and undomed and having sharply cut burr-free, substantially vertical edges,

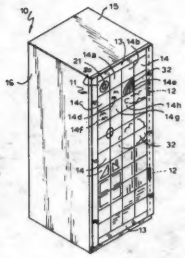
wherein said shape is die cut by application of a female cutting die to one surface of said laminate and a male punch to the other surface of said laminate, while preventing said laminate from bowing, said female cutting die comprising a die cavity, a steel rule knife edge at the mouth of said die cavity, a pressure platform mounted in said cavity, and a resilient mounting means supporting said platform, wherein as said laminate is die cut, said laminate is engaged in the area of said designs between the face of said punch and said resiliently mounted platform, and sufficient force is applied to said substrate against said punch that said substrate cannot bow under said punch as said shape is cut.

4,599,254

ARTICLE OF FURNITURE HAVING CHANGEABLE DECORATIVE SURFACE

Angelo Cuttica, Quargnento, Italy, assignor to J & G Importing Inc., Hauppauge, N.Y.

Filed Aug. 9, 1984, Ser. No. 638,929
Int. Cl.[4] B32B 3/14
U.S. Cl. 428—45 10 Claims



1. An article of furniture having an exposed changeable decorative surface arrangement, the arrangement comprising:

a plurality of tiles, at least some of which carry decorative matter on their exposed surfaces,

retaining means carried by the edges of each tile, the retaining means of each tile being cooperable with the retaining means of other tiles to maintain the tiles in engagement with one another while permitting relative sliding movement between the tiles in the plane of the decorative surface,

a frame fixed to the furniture, all the tiles being located within the frame,

retaining means carried by the frame and cooperable with the retaining means carried by the edges of the tiles for maintaining at least some of the tiles, at any one time, in engagement with the frame while permitting sliding movement of those tiles with respect to the frame,

the frame and tiles being so relatively sized that there is space available within the frame for accommodating at least one tile more than the number of tiles within the frame, whereby the tiles can be shifted with respect to each other, without leaving the confines of the frame, so as to change the decorative appearance of the surface arrangement,

a filler tile devoid of the retaining means for occupying said available space, and

means for securing the filler tile to the article of furniture so that the filler tile can be readily moved out of the plane of the decorative surface to establish said available space.

4,599,255

COMPOSITE STRUCTURES HAVING CONDUCTIVE SURFACES

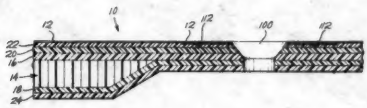
Jeanne M. Anglin, Kent; Richard R. Edwards, Bellevue, and John E. Thomas, Kent, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 334,855, Dec. 28, 1981, abandoned. This application Aug. 26, 1983, Ser. No. 526,838
Int. Cl.[4] B32B 3/12; B64C 7/00
U.S. Cl. 428—73 3 Claims

1. A conductive composite structural member for use in an aircraft structure comprising in combination:

a fiberglass honeycomb core having inner and outer fiberglass plies;

a fiberglass fabric including a plurality of electrically non-conductive fibers having electrically non-conductive surface portions interwoven with a plurality of electrically non-conductive fibers having electrically conductive surface portions; and,



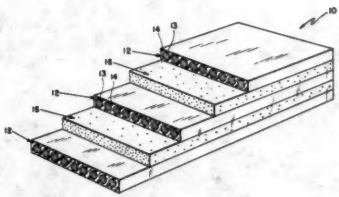
said fiberglass fabric disposed against a surface portion of said inner or outer fiberglass plies.

4,599,256

SELF-HEALING OXIDATION-RESISTANT CARBON STRUCTURE

Thomas Vasilos, Winthrop, Mass., assignor to Avco Corporation, Wilmington, Mass.

Division of Ser. No. 426,600, Sep. 29, 1982. This application Apr. 9, 1984, Ser. No. 598,117
Int. Cl.[4] B32B 5/12
U.S. Cl. 428—114 7 Claims



1. An oxidation resistant carbon-carbon composite comprising:

(a) plurality of graphite fibers therein and carbonized (graphitized) matrix,

(b) a first material including boron disposed throughout said graphitized matrix,

(c) a second material including silicon applied thereto as a coating on the exterior surfaces of the graphite fibers and graphitized matrix,

(d) whereby heating said composite in the course of service use, to a temperature at which said composite cracks enables said boron and silicon to combine to provide a borosilicate sealant of sufficiently low viscosity for sealing cracks in said composite.

4,599,257

METHOD OF FORMING A METAL FIBERGLASS INTERFACE

Charles O. Nutt, Niles, Mich., assignor to Thomas Wozniak, South Bend, Ind.

Filed Mar. 6, 1984, Ser. No. 586,623
Int. Cl.[4] B32B 31/02
U.S. Cl. 428—131 8 Claims

1. A method for forming a metal/fiberglass interface between a sheet of metal and a layer of fiberglass comprising the steps of:

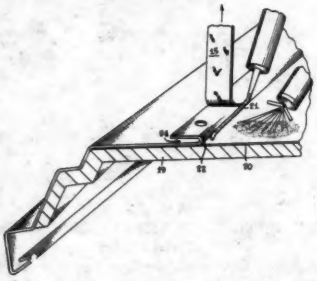
a) providing a plurality of spaced apertures along one edge of the sheet of metal to form an apertured portion;

b) bending the apertured portion of the sheet of metal to form a U-shaped channel;

c) placing the sheet of metal on a mold surface;

d) masking the apertured portion of the U-shaped channel;

e) applying a gel coat to the mold surface, wherein the gel coat contacts the exterior bend of the U-shaped channel;
f) removing the masking from the apertured portion of the U-shaped channel; and



g) applying a layer of fiberglass over the gel coat and the apertured portion of the sheet metal, wherein the layer of fiberglass covers a substantial portion of the metal sheet, and flows through the apertures to fill the U-shaped channel.

4,599,258

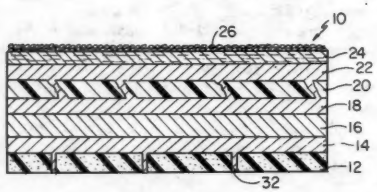
IN SITU ROOFING COMPOSITE AND METHOD

John P. Hageman, 42 Susan Dr., Closter, N.J. 07624

Continuation-in-part of Ser. No. 642,576, Aug. 20, 1984, Pat. No. 4,521,478. This application Mar. 25, 1985, Ser. No. 715,286

Int. Cl.⁴ B32B *3/10, 5/02*

U.S. Cl. 428—140 **20 Claims**



1. A built-up, in situ roofing composite applied upon a roof substrate having seams, comprising:
a first layer of water-proofing ingredients selected from a group consisting of asphalt, modified asphalt and coal tar;
a base sheet applied over said first layer;
a second layer of water-proofing ingredients applied over said base sheet;
at least one ply of non-woven polyester sheeting overlaying said second layer of water-proofing ingredients;
a third layer of water-proofing ingredients applied over said polyester sheeting, said third layer melding with said second layer to form a composite with said polyester sheeting; and
an insulating, heat-resistant layer of material disposed over said built-up composite membrane forming a roofing composite that is substantially split-resistant.

4,599,259

COVER FILM FOR SUBLIMATION TRANSFER TYPE HARD COPY

Naotake Kobayashi; Tetsuya Abe; Satoru Shinohara, and Yoshio Fujiwara, all of Utsunomiya, Japan, assignors to Sony Corporation, Tokyo, Japan

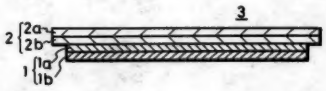
PCT No. PCT/JP83/00374, § 371 Date Jun. 22, 1984, § 102(e) Date Jun. 22, 1984, PCT Pub. No. WO84/01745, PCT Pub. Date May 10, 1984

PCT Filed Oct. 25, 1983, Ser. No. 624,683

Claims priority, application Japan, Oct. 25, 1982, 57-187066; Nov. 8, 1982, 57-195588

Int. Cl.⁴ B41M *5/26*

U.S. Cl. 428—204 **8 Claims**



1. A color hard copy print comprising:
a printing substrate,
sublimation dyes of three primary colors selectively formed on one surface of said printing substrate by thermal transfer of said dyes, and
a cover film formed on said one surface of said substrate by melt bonding thereon, said cover film including a resinous layer containing an organic compound of a metal selected from the group consisting of Al, Mg, Ca, and Sn.

4,599,260

DIRECTLY PRINTABLE TAPE WITH NOVEL RELEASE COATING

Bernard S. Truskolaski, Lake Elmo, and Daniel P. Pohl, Grant Township, Washington County, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 23, 1985, Ser. No. 694,082

Int. Cl.⁴ B32B *5/16;* **C09J** *7/02*

U.S. Cl. 428—207 **27 Claims**

1. A printed pressure-sensitive adhesive tape comprising a backing film, the faceside thereof being coated wtih a pressure-sensitive adhesive and the backside thereof being coated with a low adhesion backsize coating comprising
(1) at least one low adhesion backsize compound, and
(2) a chlorinated polyolefin in an amount sufficient to promote ink adhesion,
wherein said low adhesion backsize coating bears an inked impression and is low-force removable from said pressure-sensitive adhesive without transfer of said inked impression to said pressure-sensitive adhesive.

4,599,261

HIGH HEAT, SOUND DAMPING METAL-POLYMER LAMINATE

William W. C. Hart, Katy, and William H. Korcz, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 6, 1984, Ser. No. 577,646

Int. Cl.⁴ B32B *7/02*

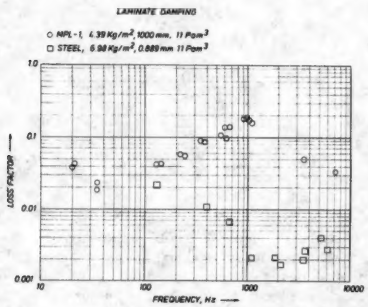
U.S. Cl. 428—213 **18 Claims**

1. A metal-polymer-metal structural laminate having an unexpected property balance of high stiffness, improved sound damping, good adhesion between polymer and metal, and automotive paint bake oven stability, said laminate comprising a core of polymeric resinous material having tightly adhered to each side thereof a metal skin layer wherein:
(a) said metal skin layer is about 5 to about 40 mils thick;
(b) said laminate has a ratio of core thickness to skin thickness of between about 1:3 and about 20:1;

(c) said laminate total thickness is between about 15 mils and about 300 mils;

(d) said polymeric resinous material comprises the admixture obtained by intimately mixing a block copolymer, a butene-1 polymer and an engineering thermoplastic resin so as to form at least partial continuous interlocking networks wherein

(i) said block copolymer comprises at least two monoalkenyl arene polymer end blocks A and at least one substantially completely hydrogenated conjugated diene mid block B, said block copolymer having an 8 to 55 percent by weight monoalkenyl arene polymer block content, each polymer block A having an average molecular weight of between about 5,000 and about 125,000, and each polymer block B having an average molecular weight of between about 10,000 and about 300,000;



(ii) said engineering thermoplastic resin has a generally crystalline structure and a melting point over about 120° C.; and

(iii) said butene-1 polymer is selected from the group consisting of butene-1 homopolymers, butene-1-alphamonoolefin copolymers, functionalized butene-1 homopolymers, functionalized butene-1-alphamonoolefin copolymers and mixtures thereof where said alphamonoolefin is selected from ethylene, propylene and C_5 to C_{10} alphamonoolefins and the alphamonoolefin content of said copolymers is between about 0.1 and about 30.0 mole percent; and

(d) wherein said polymeric resinous material comprises 60 to 20 weight percent engineering thermoplastic, 15 to 40 weight percent butene-1 polymer and 25 to 40 weight percent block copolymer.

4,599,262

ELECTRICALLY CONDUCTIVE POLYCARBONATE LAMINATES AND THEIR PREPARATION

Bernhard Schulte, Krefeld; Werner Tischer; Hans Kaloff, both of Dormagen, and Hans-Leo Weber, Rommerskirchen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 6, 1984, Ser. No. 668,911

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1983, 3340930

Int. Cl.⁴ B32B *7/02, 27/36;* **C25D** *9/02;* **H01B** *1/06*

U.S. Cl. 428—215 **18 Claims**

1. A polycarbonate laminate consisting of

(A) an aromatic, thermoplastic polycarbonate layer containing 5 to 45% by weight, based on the weight of polycarbonate layer (A), of carbon black or graphite and having an $\overline{M}w$ (weight-average molecular weight) of 20,000 to 300,000, a surface resistivity of 1 to $10^9\Omega$ and a thickness of 0.002 to 0.4 mm, and

(B) a layer, firmly lamiated to the above layer, of an aromatic, thermoplastic polycarbonate with an $\overline{M}w$ (weight-average molecular weight) of 10,000 to 60,000 and a thickness of 0.02 to 5 mm.

16. A process for the production of a polycarbonate laminate according to claim 1, in which extruded polycarbonate film which is produced by extrusion and contains 0 to 45% by weight, based on the total weight of layer (B), of one or more further components selected from thermoplastic polyethylene terephthalates, thermoplastic polybutylene terephthalates and ABS plastics, and is 0.02 to 5 mm thick, is pressed together with a cast polycarbonate film, which is optionally stretched and which contains 5 to 45% by weight, based on the weight of the cast polycarbonate film, of carbon black or graphite and has a thickness of 0.002 to 0.4 mm, between two rolls under pressures of 5 to 100 bar and at melt temperatures of the extruded film of 200° to 320° C.

4,599,263

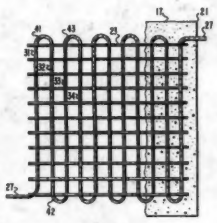
COMPONENT ASSEMBLY AND TAPE FOR NONDESTRUCTIVE DEBONDING

Edward A. Anderson, 5091 Torida Way, Yorba Linda, Calif. 92682, and Ernesto S. Sandi, 1736 Via Palermo, Montebello, Calif. 90640

Filed Dec. 23, 1983, Ser. No. 564,942

Int. Cl.⁴ D03D *3/00*

U.S. Cl. 428—225 **3 Claims**



2. A tape product comprising:

plural longitudinally extending filaments; and

a woof woven transversely through said longitudinally extending filaments, said woof including successive transverse segments spaced longitudinally from one another on a pitch substantially less than the width of the tape, each said transverse segment extending substantially the width of said tape, said transverse segments collectively spanning the longitudinal extent of said longitudinally extending filaments, said woof having a tensile strength at least ten times the average tensile strength of said filaments.

4,599,264

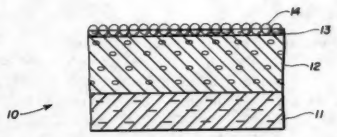
DECORATIVE LAMINATE

William J. Kauffman, Lititz; Timothy D. Colyer, Columbia, and Martin Dees, Jr., Landisville, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Oct. 24, 1984, Ser. No. 664,420

Int. Cl.⁴ B32B *7/00, 23/08*

U.S. Cl. 428—264 **20 Claims**



1. A decorative laminate suitable as a floor covering comprising

a substrate;

a printed layer of absorptive PVC resin particles of single particle thickness of type GP PVC resin having a particle size diameter between about 6 mils and about 20 mils adhered to said substrate; and

a layer up to 10 mils thick of transparent synthetic organic polymer adhered to the printed layer of said absorptive PVC resin;

whereby the printed regions of said decorative laminate of said layer of absorptive PVC resin particles exhibit through-color printing.

4,599,265

REMOVABLE PRESSURE-SENSITIVE ADHESIVE TAPE

Donald L. Esmay, Coon Rapids, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 439,047, Nov. 4, 1982, Pat. No. 4,522,870. This application Feb. 13, 1985, Ser. No. 701,442

The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.

Int. Cl.[4] C09J *7/02*

U.S. Cl. 428—355 **12 Claims**

1. Pressure-sensitive adhesive tape comprising a flexible carrier web and a pressure-sensitive adhesive layer comprising a polymer of one or more monomers which are predominantly alkyl acrylate, the alkyl groups of which have an average of 8–12 carbon atoms, and are nearly free from any polar copolymerizable monomer, wherein up to 3 mol percent of said polar copolymerizable monomers comprise strongly polar copolymerizable monomer and up to 15 mol percent of said polar copolymerizable monomers comprise moderately polar copolymerizable monomer, said adhesive layer being crosslinked to provide a 180° peelback value from glass within the range of 5 to 30 N/dm immediately after being applied, which value does not increase more than 20% after 30 days dwell at 22° C., thus assuring both reliable adhesion and clean peelability after prolonged dwell.

4,599,266

MAGNETIC RECORDING MEDIUM

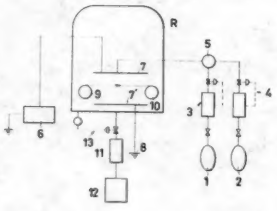
Masatoshi Nakayama; Haruyuki Morita; Yasumichi Tokuoka; Toshiaki Izumi, all of Saku; Kazumasa Fukuda, and Yuichi Kubota, both of Komoro, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Continuation of Ser. No. 504,643, Jun. 15, 1983, abandoned. This application Mar. 18, 1985, Ser. No. 713,562

Claims priority, application Japan, Jun. 18, 1982, 57-103926

Int. Cl.[4] G11B *5/72*

U.S. Cl. 428—336 **13 Claims**



1. A magnetic recording medium comprising a base, a magnetic layer formed thereon consisting essentially of a metal or a metal with a binder, and a thin film of a polymer having a siloxane linkage, said thin film formed by a plasma polymerization means so as to cover said magnetic layer.

9. A process for forming a low-friction siloxane polymer on a magnetic recording medium comprising contacting a medium having a base and a magnetic layer formed thereon consisting essentially of a metal or a metal with a binder with a plasma of a monomer polymerizable to a siloxane polymer, and polymerizing said monomer to form a thin polymer film on the surface of said medium.

4,599,267

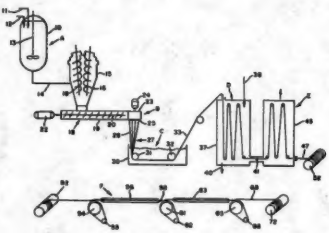
HIGH STRENGTH AND MODULUS POLYVINYL ALCOHOL FIBERS AND METHOD OF THEIR PREPARATION

Young D. Kwon, Morristown; Sheldon Kavesh, Whippany, and Dusan C. Prevorsek, Morristown, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 432,044, Sep. 30, 1982, Pat. No. 4,440,711. This application Jan. 11, 1984, Ser. No. 569,818

Int. Cl.[4] D02G *3/00*; B29C *17/02*

U.S. Cl. 428—364 **21 Claims**



1. A polyvinyl alcohol fiber of weight average molecular weight at least about 500,000 and having a tenacity of at least about 10 g/denier, a tensile modulus of at least about 200 g/denier and a melting temperature of at least about 238° C.

4,599,268

PRODUCT CONTAINING AN EPOXY COMPOSITION

Leroy N. Chellis, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 600,619, Apr. 16, 1984, Pat. No. 4,550,128. This application Sep. 20, 1985, Ser. No. 778,060

Int. Cl.[4] B32B *27/12*

U.S. Cl. 428—394 **16 Claims**

1. A product comprising a fibrous substrate impregnated with the composition of matter comprising:

(A) about 25 to about 30 parts by weight of a tetrabrominated diglycidyl ether of bisphenol-A having an epoxy equivalent weight of about 350 to about 450;

(B) about 10 to about 15 parts by weight of a second and different tetrabrominated diglycidyl ether of bisphenol-A having an epoxy equivalent weight of about 600 to about 750;

(C) about 55 to about 65 parts by weight of at least one epoxidized non-linear novolak having at least six terminal epoxy groups; and

(D) a hardening agent for the composition.

4,599,269

FOAMABLE PLASTICS GRANULES AND PACKAGING MATERIAL PREPARED THEREFROM

Günter Kohaut, Königstein; Werner Weber, Nauheim, both of Fed. Rep. of Germany; Herman Groenendijk, Oosterhout, Netherlands; Adrianus C. Poppelaars, and Wilhelmus H. J. Janssen, both of Breda, Netherlands, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 10, 1984, Ser. No. 679,907

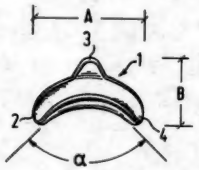
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1983, 3344685; Sep. 27, 1984, 3435440

Int. Cl.[4] B32B *5/16*; B29B *9/00*; B65D *81/12*

U.S. Cl. 428—397 **27 Claims**

1. Plastics granules composed of foamable particles in star shape, wherein the plastics granules are composed predomi-

nantly of of particles derived from a star-shaped fundamental solid having three, five or more sides, in the case of three sides the surfaces of two sides being curved relative to one another in a paraboloidal manner, while the surface of the third side has a paraboloidal curvature which is opposed thereto, and, in the case of five or more sides, four sides are each curved relative



to one another in a paraboloidal manner, while the surface or surfaces of the remaining side or sides have a paraboloidal curvature which is opposed to the curvature of the four sides, whereby, in each of these cases, a three-dimensionally domed structure is formed and has paraboloidal surfaces of curvature which are staggered in relation to one another.

4,599,270

ZIRCONIUM OXIDE POWDER CONTAINING CERIUM OXIDE AND YTTRIUM OXIDE

Subramaniam Rangaswamy, Port Jefferson Station, and John H. Harrington, Warwick, both of N.Y., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 2, 1984, Ser. No. 606,024
Int. Cl.[4] B05D *1/08*
U.S. Cl. 428—402 **8 Claims**

1. A flame spray material characterized by ability to produce coatings having low thermal conductivity, comprising a homogeneous ceramic composition consisting of:

zirconium oxide optionally containing up to about 10 percent of hafnium oxide based on the total weight of the zirconium oxide and hafnium oxide;

cerium oxide; and

yttrium oxide;

the cerium oxide being present in an amount between about 23 and 29 percent based on the total weight of the zirconium oxide, hafnium oxide and cerium oxide; and

the yttrium oxide being present in an amount between about 1 and 4 percent based on the total weight of the zirconium oxide, hafnium oxide, cerium oxide and yttrium oxide.

4,599,271

MICROENCAPSULATION OF POLYISOCYANATES BY INTERCHANGE OF MULTIPLE

Hung-Ya Chao, Williamsville, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Continuation-in-part of Ser. No. 502,477, Jun. 9, 1983, Pat. No. 4,495,509. This application Sep. 10, 1984, Ser. No. 648,964
The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.
Int. Cl.[4] B01J *13/02*; B32B *27/42*
U.S. Cl. 428—402.21 **14 Claims**

8. Microcapsules having generally continuous polymeric walls prepared by a method comprising the following steps:

(a) preparing a first organic-in-aqueous emulsion comprising a first organic solution having a first oil soluble reactive material dissolved therein and a first aqueous emulsification solution, said first oil soluble reactive material being a polyisocyanate;

(b) preparing a second organic-in-aqueous emulsion comprising a second organic solution having a second oil soluble reactive material dissolved therein and a second aqueous emulsification solution, said second oil soluble reactive material being an amine; and

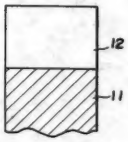
(c) mixing said organic-in-aqueous emulsions such that said oil soluble reactive materials react to form said microcapsules, said microcapsules encapsulating said first oil soluble reactive material.

4,599,272

ANTI-REFLECTION COATING FOR OPTICAL COMPONENT AND METHOD FOR FORMING THE SAME

Hajime Ichikawa, Tokyo, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Sep. 7, 1984, Ser. No. 648,729
Claims priority, application Japan, Sep. 20, 1983, 58-173848
Int. Cl.[4] B32B *27/36*
U.S. Cl. 428—412 **14 Claims**



1. An optical component comprising a substrate for said optical component and an anti-reflection coating, formed on said substrate by subjecting a mixture of 10 to 30% of SiO_2 and an evaporating material having an anti-reflection effect to vacuum evaporation at room temperature.

4,599,273

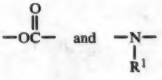
PHOTOLABILE BLOCKED SURFACTANTS AND COMPOSITIONS CONTAINING THE SAME

Gilbert L. Elan, White Bear Lake, and John E. Trend, Saint Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Division of Ser. No. 177,288, Aug. 11, 1980, Pat. No. 4,478,967. This application May 10, 1984, Ser. No. 608,954
Int. Cl.[4] C08F *8/00*; B32B *27/36, 27/30*; B05D *3/06*
U.S. Cl. 428—412 **20 Claims**

1. A coating composition which is releasable from a substrate upon exposure to actinic radiation comprising an actinic radiation transmissive thermoplastic organic film-forming binder having blended therein, in a quantity sufficient to release a coating of said binder from a substrate, a photolabile blocked surfactant having the general formula (P—X—$_a$R wherein

(—X—$_a$R is the hydrogen-eliminated residue of a surfactant having the formula (H—X—$_a$R wherein X is a polar divalent radical wherein X is selected from the group consisting of



wherein R^1 is hydrogen or lower alkyl having from 1 to 4 carbon atoms;

P is a photolabile masking group which prior to exposure to actinic radiation masks the polar properties of X and upon exposure to actinic radiation will unmask the polar properties of X;

R is a hydrophobic group which provides in said surfactant (H—X—$_a$R a log (critical micelle concentration) equal to or less than −2; and

a is a number from 1 to 4 to satisfy the valency of R.

4,599,274

PHOTO-CURABLE ADHESIVE COMPOSITION FOR GLASS LAMINATION AND LAMINATED GLASS AND PROCESS FOR ITS PRODUCTION

Toshihiro Ando; Yutaka Nakanishi, and Kenkichi Ukita, all of Machida, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1984, Ser. No. 585,255

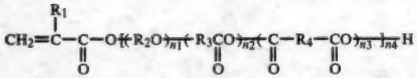
Claims priority, application Japan, Mar. 11, 1983, 58-39116; Mar. 11, 1983, 58-39117; Jul. 4, 1983, 58-121239

Int. Cl.[4] C08J 3/28; C08L 33/10

U.S. Cl. 428—442 9 Claims

1. A photo-curable adhesive composition for glass lamination, which comprises:

(A) 100 parts by weight of a (meth)acrylate monomer represented by the formula:



(I)

where R_1 is a hydrogen atom or a CH_3-group, each of R_2, R_3 and R_4 is a straight-chained or branched alkylene group, each of n_1 and n_4 is an integer of at least 1 and each of n_2 and n_3 is an integer of 0 or at least 1, and having a molecular weight of from about 116 to about 5,000;

(B) from 0.1 to 5 parts by weight of a photosensitizer;

(C) from 0.1 to 5 parts by weight of a silane coupling agent which improves moisture resistance and durability; and

(D) from 0 to 100 parts by weight of a plasticizer that will not decrease the transparency of the adhesive.

9. A laminated glass product obtained by laminating glass sheets by means of the photo-curable adhesive composition as defined in claim 1.

4,599,275

METAL-DEPOSITED PAPER AND METHOD FOR PRODUCTION THEREOF

Akira Hayashi, Urawa; Yutaka Hirota, Mitaka, and Mitsuhiro Tanaka, Ohtake, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 162,896, Jun. 25, 1980, abandoned. This application Jun. 13, 1984, Ser. No. 619,410

Claims priority, application Japan, Jun. 29, 1979, 54-81298; Feb. 25, 1980, 55-22578

Int. Cl.[4] B32B 15/08

U.S. Cl. 428—461 8 Claims

1. A metal-deposited paper comprising a paper substrate, a thin continuous coating of an alkali metal ion cross-linked product of an ethylene/methacrylic acid copolymer, an ionomer resin, on at least one surface thereof, and an aluminum film vacuum-deposited on the resin coating to a thickness of about 100 to about 1000 A, said continuous resin coating having been formed by coating an aqueous dispersion of the ionomer resin in at least two coating cycles on the surface of the paper substrate so that the amount of solids coated is about 1 to about 30 g/m^2.

4,599,276

HEAT-STERILIZABLE LAMINATE FILMS

Francesco Martini, Rho, Italy, assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed Oct. 22, 1984, Ser. No. 663,650

Claims priority, application United Kingdom, Nov. 9, 1983, 8329850

Int. Cl.[4] B32B 27/08

U.S. Cl. 428—520 5 Claims

1. A heat sterilizable laminate consisting of a layer of an ethylene-vinyl acetate copolymer containing 18 to 40 percent by weight of vinyl acetate units said layer being substantially unoriented and, on each side of the said layer, a layer of 60 to 100 percent by weight of a propylene-ethylene copolymer containing 2 to 4.5 percent by weight of ethylene units, and 40 to 0 percent by weight of an impact modifier containing 30 to 63 parts by weight of an ethylene-propylene elastomer or ethylenepropylene-diene elastomer having an ethylene content of 55 to 70 weight percent and 70 to 37 parts by weight of a thermoplastic ethylene-vinyl acetate copolymer containing 9 to 40 percent of vinyl acetate units.

4,599,277

CONTROL OF THE SINTERING OF POWDERED METALS

James M. Brownlow, Crompond, and Robert Rosenberg, Peekskill, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 9, 1984, Ser. No. 659,158

Int. Cl.[4] B22F 3/00

U.S. Cl. 428—552 37 Claims

1. In a process for sintering a metal member bonded to a substrate during which the metal member undergoes densification at a temperature which is different from the curing temperature of the substrate, the improvement which comprises causing the densification temperature of the metal member to be closer to or identical with the curing temperature of the substrate by adding to said metal member prior to sintering an amount of organometallic compound which undergoes decomposition before the densification temperature of the metal member has been reached to provide under the sintering conditions employed a densification temperature-modifying amount of a metal or metal oxide which can be the same as or different from the metal of the aforesaid metal member.

4,599,278

PAIRING OF MATERIALS FOR HIGHLY STRESSED MACHINE PARTS

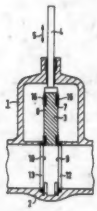
Peter-Jürgen Hofmann, Herzogenaurach, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim am Ruhr, Fed. Rep. of Germany

Filed Jan. 31, 1985, Ser. No. 696,455

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1984, 3403463

Int. Cl.[4] F16K 3/00

U.S. Cl. 428—591 4 Claims

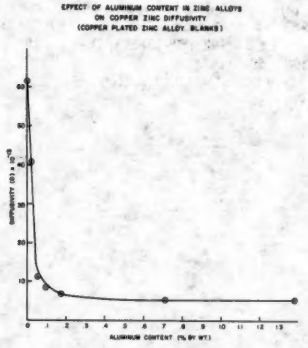


1. Material pairing for highly stressed machine parts with sliding friction between two surfaces, particularly for parallel-plate slide valves, in a corrosive environment, which comprises, one of the pair of surfaces subjected to sliding friction is formed of a hard cobalt alloy applied as hard-face welding, and the other surface of the pair of surfaces subjected to sliding friction is formed by a low-alloy, low-chromium steel which has been tempered and nitrided.

4,599,279
ZINC ALLOY FOR REDUCING COPPER-ZINC DIFFUSION

Michael J. Mirra; Jon W. Headrick, and Raymond E. Giuliani, all of Greeneville, Tenn., assignors to Ball Corporation, Muncie, Ind.

Filed Oct. 1, 1984, Ser. No. 656,129
Int. Cl.[4] B32B *15/01*
U.S. Cl. 428—658 **13 Claims**


EFFECT OF ALUMINUM CONTENT IN ZINC ALLOYS
ON COPPER ZINC DIFFUSIVITY
(COPPER PLATED ZINC ALLOY BLANKS)
ALUMINUM CONTENT (% BY WT.)

9. A blank suitable for minting into coins or similarly disc-shaped articles comprising a core formed of a zinc alloy material consisting essentially of about 0.1 to about 0.8 weight percent copper, about 0.01 to 1.5 weight percent aluminum, about 0.003 to 0.5 weight percent magnesium, the balance zinc, a continuous layer of copper completely encasing said core, said layer having a thickness of about 0.0002 to about 0.004 inch.

4,599,280
MAGNETIC RECORDING MEDIUM

Toshiaki Izumi; Kiyoshi Noguchi, and Misao Kohmoto, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Apr. 25, 1984, Ser. No. 603,668
Claims priority, application Japan, Apr. 25, 1983, 58-72585; Apr. 26, 1983, 58-73531
Int. Cl.[4] G11B *5/64*
U.S. Cl. 428—694 **17 Claims**

1. In a magnetic recording medium comprising a length of a substrate and a magnetic thin layer formed thereon by the oblique incidence evaporation process, the improvement wherein

when coercive force is measured by changing the measuring direction in a plane defined by a longitudinal direction of the substrate and a direction normal to the major surface of the substrate, the following relationship is met:

$$(Hc_{max} - Hc_{min})/Hc(0) \leqq 0.9$$

wherein

Hc_{max} is the maximum of the coercive force,

Hc_{min} is the minimum of the coercive force, and

Hc(0) is a coercive force in the longitudinal direction of the substrate, wherein the magnetic layer consists essentially of Co alone or with at least another element selected from the group consisting of Ni, Cr and O, and comprises oxygen in an atomic ratio of O/metals of up to about 0.45.

4,599,281
WEARING PART

Wilfried Schintlmeister, and Wolfgang Wallgram, both of Tyrol, Austria, assignors to Schwartzkopf Development Corporation, New York, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,445
Claims priority, application Austria, Dec. 24, 1981, 5557/81
Int. Cl.[4] B32B *9/00, 19/00, 15/04;* B05D *3/06*
U.S. Cl. 428—699 **10 Claims**

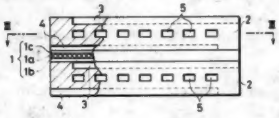
1. A wearing part comprising a hard-metal cutting insert for metal cutting having a basic body and a multi-layered coating of hard material at least one layer of which is an oxide layer, said coating consisting of one or a plurality of layers of hard material selected from the group consisting of oxycarbides, oxycarbon nitrides, oxynitrides, oxyborides, oxyboron nitrides and oxyboron carbon nitrides of the elements Ti, Zr, Hf, B, Si and Al and mixtures thereof and having an oxygen content in a range of from about 0.1 to about 5% by weight, said layers alternating with one or a plurality of layers each comprised of aluminum-boron mixed oxide having a boron content in a range of from about 0.01 to about 1% by weight.

9. The wearing part according to claim 1 produced by the method comprising depositing the hard material coating by chemical vapor deposition while adjusting the mixing ratios of the reaction gases to fix the chemical composition of the individual layers of said hard material.

4,599,282
FUEL CELL

Toshio Hirota; Hiroyuki Tajima, and Tomohiro Sugiyama, all of Kanagawa, Japan, assignors to Fuji Electric Company Ltd., Kawasaki, Japan

Filed Jan. 9, 1985, Ser. No. 689,979
Claims priority, application Japan, Sep. 19, 1984, 59-141909[U]
Int. Cl.[4] H01M *8/04*
U.S. Cl. 429—26 **8 Claims**



1. A fuel cell for receiving reactive air and fuel comprising:

at least one fuel cell element having an anode, a cathode and a matrix layer interposed therebetween, said matrix layer supporting an electroylyte, the reactive air and fuel producing reacted gased upon communication with the said fuel cell elements;

at least two substantially rectangular plate members spaced essentially in parallel and having at least one fuel cell element positioned between and in contact with each of said at least two plate members, allowing said at least one fuel cell element to contact adjacent ones of said at least two plate members, said contacting surfaces of each of said adjacent ones of said at least two plate members having four edges;

groove means extending along a first one of said contacting surfaces of said at least two plate members for supplying the reactive fuel to said cell elements, said groove means having a first entry manifold to deliver the reactive fuel to said groove means and a first exit manifold to receive reacted gases, wherein said first entry and exit manifolds are aligned along the same edge of said first one of said contacting surfaces;

channel means extending along a remaining one of said contacting surfaces of said at least two plate members for supplying reactive air to said fuel cell elements, said channel means having a second entry manifold to deliver the

reactive air to said channel means and a second exit manifold to receive reacted gases, wherein said second entry and exit manifolds are aligned along the same edge of said second one of said contacting surfaces; and

tunnel passages extending within and across the length of each of said at least two plate members, wherein said tunnel passages transfer cooling gases within each of said at least two plate members and wherein said tunnel passages extend substantially perpendicular to said groove means and said channel means.

4,599,283

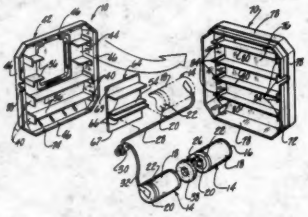
POWER CELL ASSEMBLY

Karl O. Thiele, Bloomfield Hills, and Steven L. Toth, Pontiac, both of Mich., assignors to Enertronics, Inc., Clawson, Mich.

Filed Aug. 12, 1983, Ser. No. 522,823

Int. Cl.⁴ H01M *2/10, 2/04, 6/42*

U.S. Cl. 429—99 **43 Claims**



1. A portable power cell casing assembly (**10**) for housing a plurality of power cells (**14**), said assembly (**10**) comprising: an outer nonconductive housing (**35**) for supporting the power cells (**14**), and characterized by partitioning means for separating and insulating the charged cylinder portion of adjacent aligned power cells from each other, said partitioning means including connector insulating means for insulating and separating conductive connector strips extending around the ends of said partitioning means (**36**) from the adjacent cells, said partitioning means including at least one partitioning wall (**36**) extending across said housing (**35**) for separating the adjacently aligned power cells (**14**) and said connector insulating means including at least one end wall (**40**) disposed at the end of at least one of said partition walls (**36**) and being substantially perpendicular thereto whereby a connector strip (**24**) extends about said end wall and between a first charged pole (**16**) of one power cell (**14**) and an oppositely charged pole (**20**) of a second power cell (**14**).

4,599,284

VITREOUS PHOSPHORUS OXIDE-SULFIDE SOLID LITHIUM ELECTROLYTE

James R. Akridge, Parma, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 1, 1985, Ser. No. 782,467

Int. Cl.⁴ H01M *6/18*

U.S. Cl. 429—191 **18 Claims**

1. A phosphorus oxide-sulfide solid state electrolyte of the composition:

$$P_4O_aS_b,\ cLi_2S,\ dLi_2O,\ eX$$

where:

X is selected from the group consisting of LiBr, LiCl, LiF, LiI, Li_2CO_3, Li_2SO_4, Li_2SiO_3 and Li_4SiO_4;

a is equal to (10−b) with b being greater than 0 and less than 10 with the proviso however that when b is 6 a can be 3;

c and d are from 0 to about 4 with the proviso that when c and d are both greater than 0 then d=4−c, and when c or d is 0 then d or c, respectively, is greater than 0; and

e is from 0 to about 7.

4,599,285

MULTIPLEX IMAGE REPRODUCING METHOD

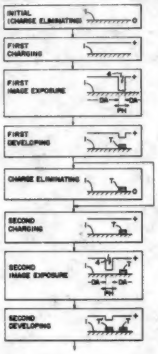
Satoshi Haneda; Hisashi Shoji, and Seiichiro Hiratsuka, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 1, 1984, Ser. No. 656,582

Claims priority, application Japan, Oct. 3, 1983, 58-183152; Oct. 4, 1983, 58-184381; Oct. 7, 1983, 58-187000; Oct. 7, 1983, 58-187001; Dec. 17, 1983, 58-238295; Dec. 17, 1983, 58-238296; Jan. 26, 1984, 59-13167

Int. Cl.⁴ G03G *13/08*

U.S. Cl. 430—54 **26 Claims**



1. A method of reproducing multiplex images comprising the steps of forming an electrostatic image on an image retainer having thereon an electrostatic image retaining layer by using an electrostatic image forming means, developing the electrostatic image formed on the image retainer to form a toner image, said developing being carried out under such conditions that an oscillating electric field is applied between the image retainer and a developer feeding carrier to form a dielectric layer for retaining said electrostatic images, repeating the steps of the above to superpose a plurality of toner images on the image retainer, and transferring the toner images onto a recording paper in one step.

4,599,286

PHOTOCONDUCTIVE IMAGING MEMBER WITH STABILIZER IN CHARGE TRANSFER LAYER

William W. Limburg, Penfield, and Dale S. Renfer, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 24, 1984, Ser. No. 686,044

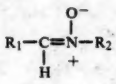
The portion of the term of this patent subsequent to Jan. 7, 2003, has been disclaimed.

Int. Cl.⁴ G03G *5/14*

U.S. Cl. 430—59 **9 Claims**

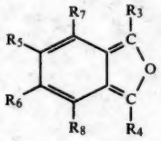
1. An electrophotographic imaging member comprising a conductive layer, a charge generation layer and a charge transport layer, said charge transport layer comprising an aromatic amine charge transport molecule in a continuous polymeric binder phase and from about 0.01 percent by weight to about 5 percent by weight based on the total weight of said transport layer of a chemical stabilizer selected from the group consisting of

I. a nitrone compound having the structural formula



wherein R_1 is selected from the group consisting of a substituted and unsubstituted group selected from the group consisting of a phenyl group, a fused ring aromatic group and a heterocyclic group, and R_2 is selected from the group consisting of a substituted and unsubstituted group selected from the group consisting of a linear or branched alkyl group containing 1 to 20 carbon atoms, a phenyl group, a fused ring aromatic group and a heterocyclic group,

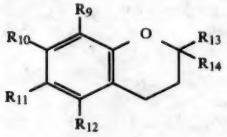
II. an isobenzofuran compound having the structural formula



wherein R_3, R_4, R_5, R_6, R_7 and R_8 are independently selected from the group consisting of substituted and unsubstituted alkyl groups containing 1 to 10 carbon atoms and substituted and unsubstituted phenyl groups,

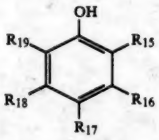
III. a hydroxyaromatic compound selected from the group consisting of

A. fused hydroxyaromatic compounds having the structural formula



wherein R_9, R_{10}, R_{11}, and R_{12} are independently selected from the groupm consisting of hydrogen, a hydroxyl group, a alkoxy group containing 1 to 6 carbon atoms, and an alkyl group containing 1 to 6 carbon atoms, wherein at least one of said R_9, R_{10}, R_{11}, and R_{12} is a hydroxyl group, and R_{13} and R_{14} are independently selected from the group consisting of hydrogen, an alkenyl group containing 2 to 40 carbon atoms, and an alkyl group containing 1 to 40 carbon atoms, and

B. monomeric and polymeric phenolic compounds having the structural formula



wherein R_{15}, R_{16}, R_{17}, R_{18}, and R_{19} aare independently selected from the group conssisting of hydrogen, a hydroxyl group, and substituted and unsubstituted groups selected from the group consisting of a linear alkyl group containing 1 to 20 carbon atoms, a branched alkyl group containing 1 to 20 carbon atoms, an alkenyl group containing 1 to 20 carbon atoms, an ester group containing 1 to 20 carbon atoms, a phenyl group, a napthyl group, and

C. substituted and unsubstituted naphthol compounds, and mixtures thereof.

4,599,287

POSITIVE CHARGING PHOTORECPTOR

Yoshihide Fujimaki; Yoshiaki Takei; Yasuo Suzuki, and Hiroyuki Nomori, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

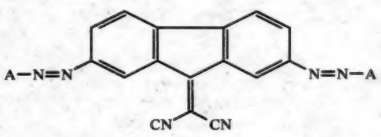
Filed Nov. 7, 1984, Ser. No. 669,696

Claims priority, application Japan, Nov. 9, 1983, 58-210622; Nov. 9, 1983, 58-210623; May 28, 1984, 59-108226; May 28, 1984, 59-108228

Int. Cl.[4] G03G *5/082*

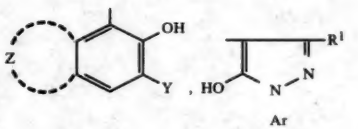
U.S. Cl. 430—59 **16 Claims**

1. A photoreceptor having a light-sensitive layer composed of a carrier generating phase and a carrier transporting phase, said carrier generating phase containing at least one compound of formula (I) and said carrier transporting phase containing at least one carrier generating compound selected from among the compounds of formulas (II), (III), (IV) and (V):

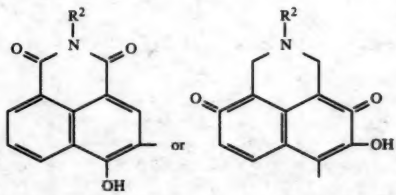


(I)

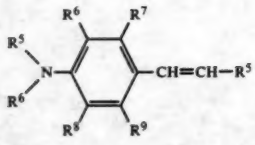
(wherein A is



Ar

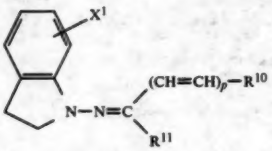


Z is the atomic group necessary for forming a substituted or unsubstituted aromatic carbon ring or a substituted or unsubstituted heterocyclic ring; Y is a hydrogen atom; a hydroxyl group, a carboxyl group or an ester thereof, a sulfo group, a substituted or unsubstituted carbamoyl group, or a substituted or unsubstituted sulfamoyl group; R^1 is a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted amino group, a substituted or unsubstituted carbamoyl group, a carboxyl group or an ester thereof, or a cyano group; Ar is a substituted or unsubstituted aryl group; and R^2 is a substituted or unsubstituted alkyl group, a substituted or unsubstituted aralkyl group, or a substituted or unsubstituted aryl group);



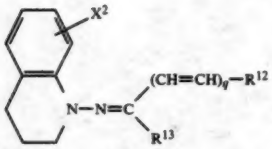
(II)

(wherein R^3 and R^4 are each a substituted or unsubstituted alkyl group, or a phenyl group; R^5 is a substituted or unsubstituted phenyl group, a naphthyl group, an anthryl group, a fluorenyl group or a heterocyclic group, with the possible substituent being an alkyl group, an alkoxy group, a halogen atom, a hydroxy group or a phenyl group; R^6 to R^9 are each a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group or an alkylamino group);



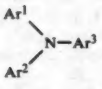
(III)

(wherein R^{10} is a substituted or unsubstituted aryl group or a substituted or unsubstituted heterocyclic group; R^{11} is a hydrogen atom a substituted or unsubstituted alkyl group or a substituted or unsubstituted aryl group; X^1 is a hydrogen atom, a halogen atom, an alkyl group, a substituted amino group or an alkoxy group; p is an integer of 0 or 1);



(IV)

(wherein R^{12} is a substituted or unsubstituted aryl group, or a substituted or unsubstituted heterocyclic group; R^{13} is a hydrogen atom, a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group; X^2 is a hydrogen atom, a halogen atom, an alkyl group, a substituted amino group, an alkoxy group or a cyano group; q is an integer of 0 or 1);



(V)

(wherein Ar^1 and Ar^2 are each a substituted or unsubstituted phenyl group; Ar^3 is a substituted or unsubstituted phenyl group, a naphthyl group, an anthryl group, a fluorenyl group or a heterocyclic group).

4,599,288

ELECTROPHOTOGRAPHIC PLATE-MAKING MATERIAL

Tetsuro Fuchizawa, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 19, 1984, Ser. No. 590,669
Claims priority, application Japan, Mar. 18, 1983, 58-45514
Int. Cl.[4] G03G 5/14
U.S. Cl. 430—63 17 Claims

1. An electrophotographic plate making material, comprising:

a support with a volume resistance of $10^{10}\Omega$ or less

which support comprises at least one resin overlayer prepared from a compound or a composition containing at least one compound with at least one unsaturated bond polymerizable by electron beam irradiation which has a thickness in the range of 5–50μ and is hardened and polymerized by electron beam irradiation with an electron beam with an acceleration voltage in the range of 100–1,000 KV and an absorption dose in the range of 0.5 to 20 megarads and a base paper,

which resin layer contains electrically conductive substances selected from the group consisting of oxides of metals selected from zinc, magnesium, tin, barium, indium, molybdenum, aluminum, titanium, silicon, fine particles of crystalline oxide or complex oxides, or carbon black in an amount in the range of 5–30 wt% based on the weight of the compound or composition to be hardened and polymerized by electron beam irradiation, and

wherein a photoconductive layer is present on the resin layer.

4,599,289

PRESSURE-FIXABLE ENCAPSULATED TONER

Koushi Suematsu, Kawasaki; Tetsuo Hasegawa, Tokyo, and Ichiro Osaki, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 497,160, May 23, 1983, abandoned.
This application Mar. 22, 1985, Ser. No. 715,573
Claims priority, application Japan, May 27, 1982, 57-90267; May 31, 1982, 57-92503
Int. Cl.[4] G03G 9/08, 9/14, 13/20
U.S. Cl. 430—98 16 Claims

1. A pressure-fixable encapsulated toner, comprising a pressure fixable polyolefin core containing a colorant and a shell entirely covering the core, the shell comprising a copolymer of 95 to 70% by weight of vinylidene chloride and 5 to 30% by weight of acrylonitrile, the weights based on the weight of the copolymer.

13. An electrophotographic process for developing an electrostatic latent image, comprising:

forming an electrostatic latent image on a photoconductive layer;

developing the latent image with a pressure-fixable encapsulated toner of claim 1 to obtain a toner image;

transferring the obtained toner image onto a transfer medium; and

fixing the transferred toner image thereon by applying pressure.

4,599,290

NEGATIVE CHARGING CARRIER PARTICLES COATED WITH A POLYMER HAVING APPENDED CHLORENDATE GROUPS

William E. Yoerger, and Louis J. Sorriero, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 2, 1985, Ser. No. 688,385
Int. Cl.[4] G03G 9/10
U.S. Cl. 430—108 23 Claims

1. A negative tribocharging carrier particle for use in a two-component electrographic developer composition, comprising on its surface a polymer having a repeating unit com-

prising an appended monovalent chlorendate group containing a carboxylic acid group, or a metal salt thereof.

4,599,291

ELECTROSTATOGRAPHIC SUSPENSION DEVELOPER OF BLOCK COPOLYMER REACTED WITH MERCAPTAN

Wolfgang Podszün; Josef Witte, both of Cologne, Fed. Rep. of Germany; Herman Uytterhoeven, Bonheiden, Belgium, and John Goossens, Cologne, Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Mar. 20, 1985, Ser. No. 714,025

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 3412085

Int. Cl.[4] G03G *9/12*

U.S. Cl. 430—114 **7 Claims**

1. Electrostatographic suspension developer containing, in an electrically-insulating carrier liquid having a volumetric resistance of at least 10^9 Ohm.cm and a dielectric constant below 3, a dispersed pigment, and from 10–50% by weight based on the quantity of pigment of a block copolymer, comprised of:

(a) a block of polymerized vinylaromatic compounds and

(b) a block of polymerized C_4–C_6-dienes, wherein the vinyl double bonds are completely or partially reacted with alkyl mercaptans.

4,599,292

METHOD AND DEVICE OF DEVELOPING AN ELECTROSTATIC LATENT IMAGE

Jun Kambara; Yuzo Ohmuro, and Nin-ichi Kamogawa, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 628,767, Jul. 9, 1984, Pat. No. 4,540,646, which is a continuation of Ser. No. 496,982, May 24, 1983, abandoned, which is a continuation of Ser. No. 326,588, Dec. 2, 1981, abandoned, which is a division of Ser. No. 832,019, Sep. 9, 1977, abandoned, which is a division of Ser. No. 608,274, Aug. 27, 1975, abandoned. This application May 31, 1985, Ser. No. 740,294

Claims priority, application Japan, Aug. 28, 1984, 59-99385

The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.

Int. Cl.[4] G03G *13/08, 13/09*

U.S. Cl. 430—122 **42 Claims**

1. A method for forming a toner image on a photosensitive material bearing an electrostatic latent image comprising

(a) introducing a one component developer consisting of fine toner particles, said particles containing a resin and ferromagnetic powder dispersed in said resin in such a fashion that a portion of said ferromagnetic powder is exposed on the surface of said toner particles, said toner particles having a specific resistivity of at least 10^{14} ohm cm and being capable of accepting a triboelectric charge,

into a toner vessel which includes a regulating plate for controlling the amount of toner to be fed,

(b) feeding said toner onto a toner feeder comprising a non-magnetic cylinder drum and a plurality of magnets disposed therein so that south and north poles are directed to the inner surface of said non-magnetic cylinder,

(c) carrying said toner, by rotary movement of either said non-magnetic cyclinder or said plurality of magnets, along the surface of said non-magnetic cylinder into close proximity to said electrostatic latent image, said toner particles developing a triboelectric charge, necessary to develop said electrostatic latent image, during steps (a) through (c) in the absence of a corona discharging device, and

(d) developing said electrostatic latent image with said toner.

4,599,293

TONER TRANSFER PROCESS FOR TRANSFERRING AND FIXING A TONER IMAGE BY MEANS OF FILM

Albrecht Eckell, Frankenthal; Albert Elzer; Gerhard Hoffmann, both of Otterstadt; Reinhold J. Leyrer, Ludwigshafen, and Heinz-Ulrich Werther, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 4, 1981, Ser. No. 327,728

Int. Cl.[4] G03G *13/16*

U.S. Cl. 430—126 **3 Claims**

1. A toner transfer film for picking up a toner image from a toner-treated surface and then fixing the transferred toner image, which consists essentially of

A. a clear, transparent base having a thickness of about 70–205 μm, and

B. a layer, firmly anchored thereto, which is also clear and transparent and is capable of picking up the toner image, which layer is solid and substantially colorless, has a temporary slight surface tack at least under the conditions of toner image transfer, has a thickness of about 0.8–90 μm and consists essentially of

1. 35–75% by weight, based on the sum of the conponents of layer B, of at least one polymeric and/or prepolymeric binder,

2. 20–64.9% by weight, based on the sum of the components of layer B, of at least one low molecular weight, ethylenically unsaturated compound which is polymerizable by free radicals and has a boiling point above 100° C. at atmospheric pressure,

3. from 0.1 to 10% by weight, based on the sum of the components of layer B, of at least one polymerization initiator which can be activated by heat and has a decomposition temperature above 60° C. and at least one polymerization initiator which can be activated by light but not by heat and forms free radicals, and

4. from 0 to 30% by weight, based on the sum of the components of layer B, of additives.

4,599,294

PARTICLES OBTAINED BY ATOMIZATION WHILE APPLYING VOLTAGE

Tohru Matsumoto, Kita, and Masuo Yamazaki, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 481,743, Apr. 4, 1983, abandoned. This application May 29, 1985, Ser. No. 738,520

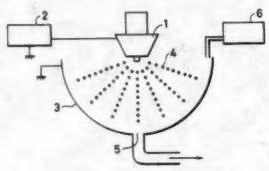
Claims priority, application Japan, Apr. 6, 1982, 57-56959; Apr. 6, 1982, 57-56960; Apr. 6, 1982, 57-56958; Jun. 10, 1982, 57-100355; Jun. 10, 1982, 57-100357; Jun. 10, 1982, 57-100361

Int. Cl.[4] G03G *9/08*

U.S. Cl. 430—137 **6 Claims**

1. A method of producing a dry spherical toner, which comprises micropulverizing a toner material containing a coloring material and a binding material through an atomizing

means under molten or dissolved state while applying an electrostatic force of 2 KV–200 KV between the atomizing means



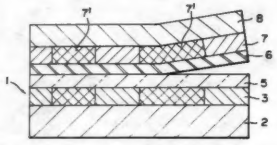
and a confronting wall opposed to the atomizing means for recovering micropulverized particles.

4,599,295

PHOTOSENSITIVE MATERIAL WITH TWO PHOTOSENSITIVE LAYERS FOR FORMING SEPARATE IMAGED ELEMENTS

Syuzi Kondo; Akira Yamano, and Keiji Toei, all of Kyoto, Japan, assignors to Dainippon Screen Seizo K.K., Japan

Filed Sep. 14, 1983, Ser. No. 532,105
Claims priority, application Japan, Oct. 7, 1982, 57-176758
Int. Cl.[4] G03C *1/46, 1/52, 1/71*
U.S. Cl. 430—156 **7 Claims**



1. A photosensitive material having a multi-layered structure comprising:

a support body;

a first photosensitive layer of non-silver salt photosensitive material formed on the support body;

a peel-off transparent or semi-transparent layer formed on the first photosensitive layer and removably adherent thereto;

a barrier layer for protecting the first photosensitive layer when a second photosensitive layer is developed removably laminated to the peel-off layer; and

a second photosensitive layer comprising a silver halide photosensitive material on the barrier layer;

whereby after picture images have been formed on the first and second photosensitive layers, the photosensitive layers can be separated between the peel-off layer and barrier layer so that each photosensitive layer is utilizable for different purposes.

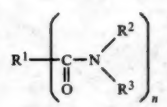
4,599,296

PROCESS FOR FORMING IMAGE

Yukihiko Sakaguchi; Toshiaki Aono, and Shinsaku Fujita, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 29, 1984, Ser. No. 595,006
Claims priority, application Japan, Mar. 30, 1983, 58-54165
Int. Cl.[4] G03C *1/40, 5/54*
U.S. Cl. 430—203 **22 Claims**

1. A process for forming an image which comprises heating a light-sensitive material comprising a light-sensitive silver halide, a binder and a dye releasing redox compound which is reductive to the light-sensitive silver halide and capable of releasing a hydrophilic dye upon reaction with the light-sensitive silver halide by heating to a temperature of about 80° C. to about 250° C., after imagewise exposure or simultaneously with imagewise exposure, in a substantially water-free condition in the presence of a compound represented by the formula (A) which does not decompose during heating:



wherein R^1 represents an unsubstituted monovalent or divalent aliphatic group; R^2 and R^3, which may be the same or different from each other, each represents a hydrogen atom, an aliphatic group or an aromatic group; and the total number of carbon atoms for R^1, R^2 and R^3 is 9 or more; and n represents 1 or 2, to imagewise form a mobile dye and transfer the thus formed mobile dye into another layer.

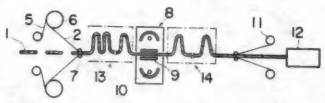
17. A process as claimed in claim 1, wherein said light-sensitive material further comprises a dye fixing layer.

4,599,297

METHOD OF MANUFACTURING PRINTED BOARDS

Yoshio Yazaki, Chofu, and Shinya Ogawa, Tokyo, both of Japan, assignors to ORC Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1982, Ser. No. 448,245
Claims priority, application Japan, Dec. 10, 1981, 56-199106
Int. Cl.[4] G03C *11/12*
U.S. Cl. 430—256 **5 Claims**



1. A method of manufacturing printed boards, comprising the steps of:

providing a dry film assembly consisting of a continuous web-like photosensitive layer sandwiched between a protective film and a base;

supplying a plurality of boards to a loading station;

removing said base and feeding at least one continuous strip of said dry film assembly through said loading station and bonding each of said boards to said photosensitive layer in a spaced apart relation;

conveying said spaced apart boards from said loading station through an exposing station via attachment to said photosensitive layer, said photosensitive layer being fed intermittently;

exposing selected portions of said photosensitive layer to light at said exposing station while masking particular portions of said photosensitive layer from said exposing, said particular portions comprising a narrow band around a periphery of each of said boards;

conveying said boards attached to said photosensitive layer from said exposing station to a developing station while removing said protective film from said photosensitive layer;

developing said boards to provide said printed boards; and

removing said boards from said conveying means by dissolving said particular portions of said photosensitive layer during said developing, whereby deterioration of a developing solution by the dissolving masked portions is minimized, resulting in longer processing times per batch of developing solution.

4,599,298

GRAPHIC ARTS IMAGING CONSTRUCTIONS USING VAPOR-DEPOSITED LAYERS

Richard S. Fisch, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 16, 1984, Ser. No. 631,531
Int. Cl.[4] G03C 5/54, 1/72
U.S. Cl. 430—271 8 Claims

1. A radiation-sensitive, imageable article comprising in sequence:

a substrate,

a vapor-deposited colorant layer capable of providing an optical density of at least 0.3 to a 10 nm band of the electromagnetic spectrum between 280 and 900 nm, and

a vapor-deposited graded metal/metal oxide or metal sulfide layer.

4,599,299

PROCESS FOR PREPARING OVERCOATED PHOTOHARDENABLE ELEMENT HAVING SURFACE PROTUBERANCES

Melvin A. Neiss, Annandale, and Robert W. Woodruff, East Brunswick, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 610,843, May 16, 1984, Pat. No. 4,550,073, which is a continuation-in-part of Ser. No. 370,993, Apr. 22, 1982, abandoned. This application Jun. 25, 1985, Ser. No. 748,662
Int. Cl.[4] G03C 1/76
U.S. Cl. 430—273 9 Claims

1. A process of forming a positive image comprising (1) exposing imagewise to actinic radiation a photohardenable element comprising a support bearing, in order, two photohardenable layers having a total thickness range of 6 to 15 μm said two photohardenable layers comprising (a) 10 to 30% by weight of an ethylenically unsaturated compound capable of forming a high polymer by free radical initiated, chain propagating, addition polymerization or benzophenone type groups, (b) 10 to 60% by weight of an organic polymeric binder, and (c) 0.1 to 20% by weight of a free radical generating addition polymerization initiator system activatable by actinic radiation; and an outer polymeric nonphotosensitive liquid removable layer which is at least partially soluble in or permeable to the solvent for the photohardenable layer, the photohardenable layer adjacent to the support being pigmented or dyed and having a thickness of no more than 8 μm and an optical density of at least 3.0 over at least the spectral range of 300 to 550 nm and the photohardenable layer present immediately beneath and in contact with the outer nonphotosensitive liquid removable layer being clear and having a thickness of no more than 7 μm and present therein 5% to 50% by weight based on the weight of said photohardenable layer of substantially discrete, inert polymeric particles at least some of which protrude into and remain within the outer nonphotosensitive layer to cause protuberances in the outer nonphotosensitive layer, the size of the particles being within the range of 0.1 to 10.0 μm, not more than 50% of the particles being below 3.5 μm and having a specific gravity substantially equivalent to that of the surrounding photohardenable layer in which they are present, (2) reexposing the element to actinic radiation above 400 nm, and (3) removing by liquid development the nonphotosensitive liquid removable layer and the unpolymerized areas of the photohardenable layers, discrete, inert particles being present in the polymerized areas of the clear photohardenable layer.

2. Process for forming a photohardenable element comprising a support bearing, in order, one photohardenable layer comprising (a) 10 to 30% by weight of an ethylenically unsaturated compound capable of forming a high polymer by free radical initiated, chain propagating, addition polymerization or benzophenone type groups, (b) 10 to 60% by weight of an organic polymeric binder, and (c) 0.1 to 20% by weight of a free radical generating addition polymerization initiator system activatable by actinic radiation; and an outer polymeric nonphotosensitive liquid removable layer which is at least partially soluble in or permeable to the solvent for the photohardenable layer, the photohardenable layer being pigmented or dyed and having therein 5% to 50% by weight based on the weight of said photohardenable layer of substantially discrete, inert polymeric particles, said process comprising

(1) coating on the support an emulsion formed from (a) a solution containing at least one ethylenically unsaturated monomeric compound and at least one photoinitiator and (b) a solution containing at least one polymeric binder, and drying the photohardenable emulsion to form a layer having a maximum thickness of 8 μm, an optical density of at least 3.0 over at least the spectral range of 300 to 550 nm, and containing substantially discrete inert particles having sizes within the range of 0.1 to 10 μm, not more than 50% of the particles by volume being below 3.5 μm and having a specific gravity substantially equivalent to that of the surrounding photohardenable layer in which they are present; and

(2) overcoating the dry photohardenable layer with the liquid developable nonphotosensitive solution and drying said solution to form a layer whereby at least some of the inert particles protrude into the nonphotosensitive layer causing protuberances therein.

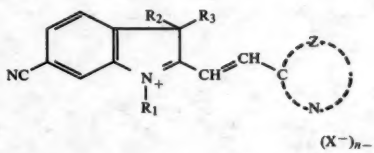
4,599,300

DIRECT POSITIVE SILVER HALIDE PHOTOGRAPHIC EMULSIONS

Akira Tanaka; Hidetoshi Miura, and Masao Koga, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Nov. 28, 1984, Ser. No. 675,744
Claims priority, application Japan, Dec. 6, 1983, 58-230382
Int. Cl.[4] G03C 5/24, 1/02
U.S. Cl. 430—411 8 Claims

1. A direct positive silver halide photographic emulsion fogged with light or chemical foggants which contains at least one dimethine spectral sensitizing dye containing a cyano-substituted indolenine ring in molecular structure and represented by the general formula:



(I)

wherein R_1 is a group selected from a lower alkyl, a hydroxyalkyl, an acyloxyalkyl, an alkoxyalkyl, a carboxyalkyl, an alkoxycarbonylalkyl, a sulfoalkyl, an aralkyl, a sulfoaralkyl and an alkenyl, R_2 and R_3 are lower alkyl groups, Z is a group of atoms necessary to complete a nitrogen-containing 5- or 6-membered heteroring which is linked by the 1-, 3- or 4-carbon atom thereof to the dimethine chain, said nitrogen having no substituent or having a substituent selected from the group consisting of alkyl, sulfoalkyl, aryl, aralkyl and alkenyl, X is an acid anion and n is 1 or 2.

4,599,301

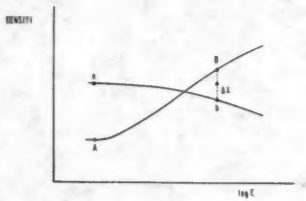
SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Yuichi Ohashi, and Tadashi Ogawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 8, 1985, Ser. No. 763,586
Claims priority, application Japan, Aug. 8, 1984, 59-164742
Int. Cl.[4] G03C 1/46, 5/00, 7/26, 7/32
U.S. Cl. 430—505 16 Claims

1. A silver halide color photographic material comprising a support having thereon at least a cyan-color-forming red-sensitive emulsion layer, a magenta-color-forming green-sensitive

emulsion layer, and a yellow-color-forming blue-sensitive emulsion layer; the weight-averaged wavelength(λ) on the spectral sensitivity distribution determined by equi-energy spectrum of said red-sensitive emulsion layer being less than 640 nm; the longest wavelength in the wavelengths having the sensitivity of ½ of the maximum value of the above-described equi-energy spectrum being in a range of from 30 nm to 55 nm



longer than the weight-averaged wavelength and the minimum wavelength thereof being in a range of from 30 nm to 55 nm shorter than the weight-averaged wavelength; in the above-described equi-energy spectrum, values A and B defined below satisfying the relation of $A/B \geqq 0.91$; and further the sum of the interlayer effects on the red-sensitive emulsion layer from the green-sensitive emulsion layer and the blue-sensitive emulsion layer being more than 0.25

$$A = \int_{\lambda_1}^{\bar{\lambda}} S(\lambda)d\lambda$$

$$B = \int_{\bar{\lambda}}^{\lambda_2} S(\lambda)d\lambda$$

wherein,

$S(\lambda)$ is the spectral sensitivity,

λ_1 is the wavelength of the short wavelength end, and

λ_2 is the wavelength of the long wavelength end.

4,599,302

COLOR PHOTOGRAPHIC RECORDING MATERIAL

Rainer Scheerer, Cologne, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 20, 1985, Ser. No. 736,098

Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420173

Int. Cl.⁴ G03C *1/46*

U.S. Cl. 430—506 **5 Claims**

1. Photographic recording material having at least one green-, and one red-sensitive layer, and at least one blue-sensitive layer S which is split up into at least three partial layers having differing sensitivities arranged so that the higher the sensitivity of a partial layer, the closer is this partial layer arranged to the object when a photograph is being taken, wherein the light-sensitive silver halide emulsion layer which is situated closest to the object when a photograph is being taken, is a partial layer S 1 of layer S and a silver halide emulsion U which is virtually insensitive to light the grains of which mainly have a diameter less than 0.05 μm is contained in the partial layer S 1.

4,599,303

NUCLEIC ACID HYBRIDIZATION ASSAY EMPLOYING PROBES CROSSLINKABLE TO TARGET SEQUENCES

Kenichi K. Yabusaki, Albany; Stephen T. Isaacs, Orinda, and Howard B. Gamper, Jr., San Rafael, all of Calif., assignors to HRI Associates, Inc., Emeryville, Calif.

Filed Dec. 12, 1983, Ser. No. 560,430

Int. Cl.⁴ C12Q *1/68;* **G01N** *33/566*

U.S. Cl. 435—6 **37 Claims**

16. A method for determining the presence of specific nucleic acid base sequences in nucleic acid target molecules comprising:

A. providing single stranded nucleic acid molecules having an essentially complementary base sequence to a defined region in the target molecules;

B. attaching labeled crosslinking molecules to said single-stranded nucleic acid molecules which are capable of forming covalent crosslinks between said single stranded nucleic acid molecules and said target molecules;

C. hybridizing said single stranded nucleic acid molecules to said defined region in said target molecules;

D. forming covalent bonds between said labelled crosslinking molecules and target molecules; and

E. measuring the amount of said labelled crosslinking molecules and single stranded nucleic acid molecules present on said target molecules.

4,599,304

METHOD FOR MONITORING ACTIVATED CELL SUBPOPULATIONS

Lewis Lanier, Los Altos, and Joseph Phillips, Redwood City, both of Calif., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Oct. 7, 1983, Ser. No. 539,876

Int. Cl.⁴ G01N *33/53;* **A61K** *39/00, 45/02;* **C12N** *15/00*

U.S. Cl. 435—7 **7 Claims**

1. A method for monitoring activated and non-activated natural killer cell subpopulations comprising:

(a) providing a sample of cells containing a population of natural killer cells;

(b) labelling selected cells of said sample with a first monoclonal antibody(s) coupled with a first fluorochrome label;

(c) labelling selected cells of said sample with a second monoclonal antibody(s) coupled with a second fluorochrome label said first fluorochrome label and said second fluorochrome label having a detectable emission difference; one of said first or second monoclonal antibodies being anti-Leu 11 and the other of said first or second monoclonal antibodies being selected from the group consisting of anti-DR, anti-Leu 10 and anti-transferrin receptor;

(d) providing excitation energy to excite said first fluorochrome label and said second fluorochrome label;

(e) detecting the fluorescence emitted by the excited fluorochromes; and

(f) distinguishing subpopulations of activated and non-activated natural killer cells relative to the detected fluorescence characteristics thereof, whereby the relative proportion of non-activated and activated natural killer cells can be monitored.

4,599,305

METHOD AND COMPOSITION FOR DETECTION OF HUMAN CHRONIC MYELOGENOUS LEUKEMIA

Owen N. Witte; Susan Watanabe, and James Konopka, all of Santa Monica, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Jul. 16, 1984, Ser. No. 631,233

Int. Cl.⁴ G01N *33/53;* **C12N** *15/00*

U.S. Cl. 435—7 **7 Claims**

1. A method for detecting chronic myelogenous leukemia in a human comprising the steps of:

adding an antibody to a biological sample from a human, wherein said antibody specifically binds with c-abl protein having tyrosine kinase activity and a molecular weight of approximately 210,000 to form an immunoprecipitate comprising said antibody bound to said c-abl protein;

mixing said antibody with said sample for a sufficient time and at a sufficient temperature to allow said antibody to bind to any of said c-abl protein present in said sample to form said immunoprecipitate; and

detecting chronic myelogenous leukemia by determining whether any of said immunoprecipitate is formed.

4,599,306

MONOCLONAL ANTIBODIES WHICH SPECIFICALLY BIND TO HUMAN IMMUNE INTERFERON

Bruce W. Altrock, Moorpark, Calif., assignor to AMGEN, Thousand Oaks, Calif.

Filed Apr. 15, 1983, Ser. No. 485,205

Int. Cl.[4] G01N *53/00*; C12N *15/00, 5/00*

U.S. Cl. 435—7 **4 Claims**

2. As a new composition, the monoclonal antibody produced from hybridoma cell line ATCC HB8291, said antibody capable of specifically binding to human IFN-γ.

4,599,307

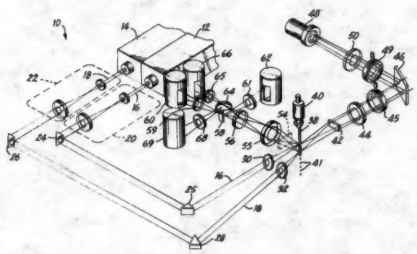
METHOD FOR ELIMINATION OF SELECTED CELL POPULATIONS IN ANALYTIC CYTOLOGY

Alex M. Saunders, San Carlos, and Chin-Hai Chang, Los Altos, both of Calif., assignors to Becton, Dickinson and Company, Paramus, N.J.

Filed Jul. 18, 1983, Ser. No. 514,425

Int. Cl.[4] G01N *33/50, 33/533*

U.S. Cl. 435—34 **16 Claims**



1. A method for identifying subpopulation of cells of interest without interference from other cells comprising

a. providing a sample of at least three types of cells including at least a first and second type of cell which form a subpopulation of cells of interest and at least a third type of cell which interferes with the identification of said subpopulation,

b. dividing said sample into at least two aliquots,

c. labelling a first antibody which is specific for said third type of cells but not for said subpopulation with at least two fluorochromes, each of said fluorochromes having distinct emission spectra,

d. forming a mixture of said differently labelled first antibody with a first one of said sample aliquots so as to label said third type of cells with said first antibody,

e. providing excitation energy to said first sample aliquot by cytometry techniques to excite each type of said fluorochromes,

f. performing a first analysis by analyzing each cell to determine the fluorescence emitted and to count said third type of cells and distinguish said third type of cells from said subpopulation,

g. retaining the information provided by said first analysis,

h. labelling a second antibody which is specific for said first type of cells of said subpopulation with at least one of said fluorochromes used to label said first antibody,

i. labelling a third antibody which is specific for said second type of cells of said subpopulation with at least one of the other of said fluorochromes used to label said first antibody,

j. forming a mixture of said differently labelled first antibody, said labelled second antibody and said labelled third antibody with another of same sample aliquots so as to label said first, second and third type of cells with the antibody specific for the respective type of cell,

k. providing excitation energy to said second sample aliquot by cytometry techniques to excite each type of said fluorochromes,

l. performing a second analysis by analyzing each cell to determine the fluorescence emitted and to count said first, second and third types of cells and to distinguish each type of cell,

m. applying the retained information of said first analysis to remove the effect of said third type of cells and to provide a direct proportional analysis of said first and said second type of said subpopulation of cells of interest.

4,599,308

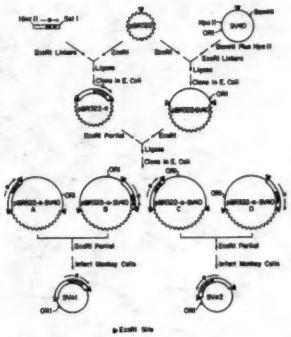
PROTEIN FROM SV40 RECOMBINANTS

Dean H. Hamer, 1828 Calvert St., N.W., Washington, D.C. 20005; Marian Kaehler, R.R. 3, Decorah, Iowa 52101, and Philip Leder, 5106 Benton Ave., Bethesda, Md. 20014

Continuation of Ser. No. 309,110, Oct. 6, 1981, abandoned. This application Sep. 29, 1983, Ser. No. 536,579

Int. Cl.[4] C12P *21/00*; C12N *15/00*

U.S. Cl. 435—68 **2 Claims**



1. A process for producing foreign proteins in eukaryotic cells comprising

(a) cleaving SV40 at 0.14 map unit with BAM HI and 0.00 map unit with EcoRI to produce a SV-40 DNA fragment containing the origin of replication;

(b) inserting said fragment into bacterial plasmid pBR322 together with pBR322 linkers between a single BAM HI site and a single EcoR1 site to produce pBR322-SV40;

(c) after cloning cleaving pBR322-SV40 at the single BAM HI site and inserting a DNA fragment from a foreign gene therein;

(d) cloning the resulting recombinant plasmid in *E. coli;*

(e) remiving the plasmid pBR322 sequences by digesting the product with Hha I to generate SV-40 - foreign gene recombinant molecule containing a pBR322 linker;

(f) treating said recombinant molecule with appropriate DNA ligase

to cyclize the recombinant molecule, then using said recombinant molecule to infect African green monkey kidney

cells together with a temperature sensitive tsA_{239} SV40 DNA as the temperature-sensitive conditional lethal helper.

4,599,309

POST CULTIVATION TREATMENT OF YEAST CELLS TO FACILITATE PRODUCT RECOVERY

Yoshinori Ohsumi, Chofu, and Takanori Sato, Yokohama, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1983, Ser. No. 560,119

Claims priority, application Japan, Dec. 14, 1982, 57-218766; Dec. 14, 1982, 57-218768

Int. Cl.[4] C12P *21/00, 19/38, 19/30, 13/12*

U.S. Cl. 435—68 10 Claims

1. A method of treating cells of a yeast containing useful substances accumulated therein, which comprises contacting said yeast cells, after cultivation, with a divalent copper ion in an aqueous suspension at a divalent copper ion concentration in the suspension of at least 5μM and at a pH of 5 to 7.5 and a temperature of 0° to 50° C. for 10 minutes to 3 hours thereby to selectively discharge low-molecular-weight compounds having a number average molecular weight of not more than 1000 present in the cytoplasm out of the cells and thereafter recovering the discharged low molecular weight compounds from the treated yeast cells.

4,599,310

PROCESS FOR PRODUCING ANTITUMOR ANTIBIOTIC COMPOUND

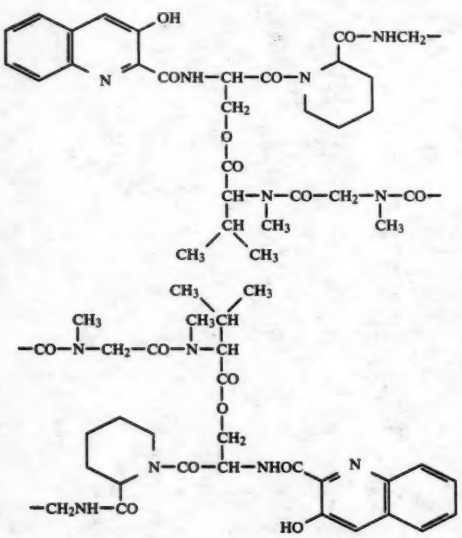
James A. Matson, and James A. Bush, both of Fayettesville, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 621,641, Jun. 18, 1984. This application Sep. 25, 1985, Ser. No. 780,121

Int. Cl.[4] C12P *21/04;* C12N *1/20;* C12R *1/01*

U.S. Cl. 435—71 3 Claims

1. A process for the preparation of the antitumor antibiotic sandramycin having the structural formula



which comprises cultivating a sandramycin-producing strain of Nocardioides sp. nov. having the identifying characteristics of ATCC 39419, or a mutant thereof, under submerged aerobic conditions in a culture medium containing assimilable sources of carbon and nitrogen until a substantial amount of sandramycin is produced and accumulated in the culture medium.

4,599,311

GLYCOLYTIC PROMOTERS FOR REGULATED PROTEIN EXPRESION: PROTEASE INHIBITOR

Glenn H. Kawasaki, 1547 - 16th Ave. East, Seattle, Wash. 98112

Filed Aug. 13, 1982, Ser. No. 408,099

Int. Cl.[4] C12P *21/04, 21/02;* C12N *1/18, 1/00*

U.S. Cl. 435—71 17 Claims

1. A DNA expression vector capable of replication in *Saccharomyces cerevisiae* and containing a *Saccharomyces cerevisiae* promoter which regulates the transcription of a glycolytic protein, which protein is triose phosphate isomerase or pyruvate kinase, said *Saccharomyces cerevisiae* followed downstream by a gene, under the regulation of said promoter, expressing a protein other than the glycolytic protein normally regulated by such promoter.

4,599,312

METHOD OF PRODUCING ENDOMYCORRHIZIAN FUNGI WITH ARBUSCULES AND VESICLES IN VITRO

Jacques Mugnier, Paris; Gerard Jung, Leuville/Orge, and Jean-Louis Prioul, Les Ulis, all of France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

Filed Jun. 17, 1983, Ser. No. 505,276

Claims priority, application France, Jun. 21, 1982, 82 10768

Int. Cl.[4] C12N *15/00, 1/14, 1/00, 5/00;* A01B *79/00*

U.S. Cl. 435—172.3 39 Claims

1. A method of producing endomycorrhiza fungi with arbuscules and vesicles in vitro comprising:

(a) transforming dicotyledon roots with a bacterium containing a root-inducing plasmid, wherein T-DNA of said plasmid becomes integrated into the root cell chromosome;

(b) cultivating the transformed root cells aseptically;

(c) inoculating said transformed root cells with endomycorrhiza spores.

4,599,313

PRESERVATION OF FOODS WITH NON-LACTOSE FERMENTING *STREPTOCOCCUS LACTIS* SUBSPECIES *DIACETILACTIS*

Carlos F. Gonzalez, Sarasota, Fla., assignor to Microlife Technics, Inc., Sarasota, Fla.

Division of Ser. No. 368,724, Apr. 15, 1982, Pat. No. 4,477,471. This application Mar. 26, 1984, Ser. No. 593,669

Int. Cl.[4] C12N *1/20, 15/00, 1/00;* C12R *1/46;* A23B *4/12;* A23C *9/12, 17/00*

U.S. Cl. 435—253 4 Claims

1. A bacterial composition which comprises in admixture:

(a) cells of a *Streptococcus diacetilactis* which is unable to ferment lactose to lactic acid as a result of the removal of a plasmid measuring about 41 Mdal from a strain of *Streptococcus diacetilactis* containing the plasmid and which produces diacetyl flavor from citrate and which inhibits bacterial spoilage in foods wherein the *Streptococcus diacetilactis* produces an inhibitory substance for *Pseudomonas fluorescens;* and

(b) cells of a leuconostoc bacterium which generates a diacetyl flavor from citrate in milk, wherein the ratio of (a) to (b) is between about 9.9 to 0.1 and 0.1 to 9.9.

4,599,314

MULTIPLE VESSEL SPECIMEN TRAY WITH LID FOR RELEASABLY ADHERING VESSEL COVERS

Yehezkel Shami, Toronto, Canada, assignor to HSC Research Development Corporation, Toronto, Canada

Filed Jun. 14, 1983, Ser. No. 504,182
Int. Cl.[4] C12M *1/00*
U.S. Cl. 435—287 8 Claims

1. A specimen tray apparatus used to hold a plurality of specimen vessels comprising:

a tray having an array of openings for receiving specimen vessels, said tray being self-standing on a support surface and being adapted to co-operate with and simultaneously support all of said specimen vessels when the tray is lifted from said support surface;

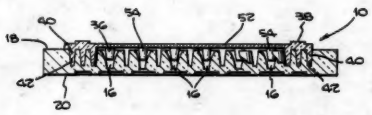
a lid adapted to co-operate with said tray and including a top having a top surface and a plurality of openings which are substantially co-incident with said openings in said tray and which openings are adapted to receive covers of said vessels; each of said specimen vessels being removable and having a cover with a generally planar top surface which top surface is accessible through the openings of said lid with said lid in place and said specimen vessels being supported in said tray with said top surfaces of said vessel covers substantially even with the top surface of said lid, so that the covers can be releasably adhered to the lid by pressure-sensitive tape applied across the lid and cover top surfaces.

4,599,315

MICRODROPLET TEST APPARATUS

Paul I. Terasaki, and Dennis Aoki, both of Los Angeles, Calif., assignors to University of California Regents, Berkeley, Calif.

Filed Sep. 13, 1983, Ser. No. 531,923
Int. Cl.[4] C12Q *1/20;* C12M *1/26, 1/32, 1/28*
U.S. Cl. 435—301 4 Claims



1. A microdroplet test apparatus adapted for use in determining HLA antigens by measuring lymphocyte cytotoxicity, said apparatus comprising:

a tray having a top surface, a bottom surface and a perimeter;

a plurality of microtest wells at spaced locations in said tray for receiving and holding test solutions including lymphocytes and selective cytotoxic reagents capable of lysing selected lymphocytes, said microtest wells including an upper rim on said tray top surface defining an opening in said tray top surface having a surface area sufficient to allow introduction of lymphocytes and reagents into said wells, a bottom having a surface area less than the surface area of said well opening and a well side wall extending between said upper rim and said well bottom, said microtest well including a central cylindrical zone defining a vertical view path wherein lymphocyte cytotoxicity is measured by determining the degree of lymphocyte lysis by viewing vertically down through the test solution present in said vertical view path and wherein said well side wall has a circular rim and the vertical cross section of said wall is arcuate, such that the slope of said side wall is less than vertical adjacent said circular rim and increases to substantially vertical slope adjacent said well bottom to thereby promote localization of said lymphocytes toward said well bottom;

a cover for said tray having a top surface, a bottom surface and a perimeter;

means associted with the perimeters of said tray and said cover for providing a seal therebetween when said cover is placed on said tray;

view path control means located on said cover extending downward from said cover bottom and insertable within said microtest wells for controlling the amount of test solution present in said vertical view path, wherein said view path control means includes a tube attached to said cover and positioned to extend vertically downward into said microtest well when said cover is in position on said tray, said tube having an internal conduit along said view path with an open bottom end which is insertable into said test solution wherein said tube and internal conduit are sized such that said test solution is drawn up into said conduit by way of capillary action to provide an increase in the depth of said test solution in said view path.

4,599,316

PHOTOMETRIC METHOD FOR THE DETERMINATION OF INORGANIC PHOSPHATE IN LIQUID SAMPLES

Benjamin A. Hahn, Yonkers, N.Y.; Richard A. Kaufman, Stanhope, and Alexander F. Wesolowski, Florham Park, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 2, 1983, Ser. No. 557,710
Int. Cl.[4] G01N *21/78*
U.S. Cl. 436—105 4 Claims

1. A method for determining the concentration of inorganic phosphate in a sample fluid, said method comprising the steps of:

(a) forming a first mixture comprising said sample fluid and an acid reagent and a surfactant;

(b) measuring light absorbance of said first mixture;

(c) forming a second mixture comprising said first mixture and ammonium molybdate reagent;

(d) measuring light absorbance of said second mixture within about 10 to about 50 seconds after the formation thereof, wherein the temperature at which the second mixture is formed and concentrations of the acid and ammonium molybdate reagents are selected such that inorganic phosphate in the sample fluid substantially completely reacts with the ammonium molydbate reagent to form a phosphomolybdate complex prior to measuring light absorbance of said second mixture;

(e) calculating a difference in light absorbance between the light absorbances measured in steps (b) and (d); and

(f) determining the concentration of inorganic phosphate in said sample fluid by comparing the difference in light absorbance for said sample fluid to a difference in light absorbance for a standard fluid having a known concentration of inorganic phosphate, said difference in light absorbance for said standard being determinable in a manner as set forth in steps (a)–(e) but employing said standard instead of sample.

4,599,317

Patent Not Issued For This Number

4,599,318

TISSUE PROTEIN PP_{19}, A PROCESS FOR OBTAINING IT, AND ITS USE

Hans Bohn, Marburg, and Wilhelm Winckler, Wenkbach, both of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg/Lahn, Fed. Rep. of Germany

Filed Feb. 7, 1985, Ser. No. 699,435
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1984, 3404563
Int. Cl.[4] C07K *15/14;* A61K *35/42, 35/50, 39/395*
U.S. Cl. 436—543 11 Claims

1. A protein PP_{19} extracted from a source of said protein and having the following characteristics:

(a) an electrophoretic mobility in the region between that of α_1 and of β_1 globulins;

(b) an isoelectric point between 4.6 and 5.4;

(c) a sedimentation coefficient $s_{20,w}$ of 3.25 ± 0.25 S;

(d) a molecular weight determined in the ultracentrifuge of 36,500±4,000;

(e) a carbohydrate fraction of 3.9±1.5 g/100 g (mannose 0.3±0.2, fucose 0.2±0.1, galactose 1.0±0.3, glucose 0.4±0.2, N-acetylglucosamine 1.2±0.3, N-acetylgalactosamine 0.1±0.1, and N-acetylneuraminic acid 0.7±0.3, each g/100 g); and

(f) an amino acid composition as in the following table:

Amino acid	Residues per 100 residues	Coefficient of variation
lysine	8.63	2.92
histidine	1.71	14.20
arginine	2.73	7.71
aspartic acid	11.51	3.99
threonine	4.20	15.75
serine	7.48	2.26
glutamic acid	11.09	3.20
proline	4.12	18.29
glycine	6.88	5.12
alanine	7.56	3.30
cystine ½	2.10	22.58
valine	7.44	3.98
methionine	2.39	7.24
isoleucine	3.40	6.38
leucine	10.03	7.29
tyrosine	2.19	2.96
phenylalanine	5.05	2.58
tryptophan	1.42	15.43

4,599,319

PBO-FREE GLASSES FOR CATHODE RAY TUBES HAVING A HIGH PROTECTIVE EFFECT AGAINST X-RAYS WHILE SIMULTANEOUSLY HAVING GOOD RESISTANCE TO ACID AND STABILITY TO RADIATION

Werner Sack, Mainz, Fed. Rep. of Germany, assignor to Schott-Glasswerke, Mainz, Fed. Rep. of Germany

Filed Jul. 6, 1984, Ser. No. 629,729

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1982, 3244970

Int. Cl.[4] C03C *3/04*

U.S. Cl. 501—57 **3 Claims**

1. PbO-free glasses for cathode ray tubes having a high protective effect against X-rays while having at the same time good resistance to acid and stability to radiation, with a heat expansion coefficient in the temperature range of 20°-300° C. from 92° to 103.8·10^{-7}/°C., characterized by the fact that their x-ray absorption coefficient μ, for 0.6 Å, lie between 53.5 and 63.1·cm^{-1}, their resistance to acid is ≦100 mg/dm^2, that they have transformation temperatures (Tg) of from 502° to 536° C., softening temperatures (Ew) of from 683° to 716° C., processing temperatures (V_A) of from 926°-991° C., densities (D) of from 3.024-3.133 g/cc and T_{K100} values of 296°-359° C., and that they contain in the starting mixture, calculated in % by weight of oxide, a composition consisting essentially of:

SiO_2: 50.0 to 52.2% by weight
Al_2O_3: 0.0 to 3.0% by weight
Li_2O: 1.0 to 1.7% by weight
Na_2O: 6.5 to 10.7% by weight
K_2O: 0.0 to 4.5% by weight
$Li_2O+Na_2O+K_2O$: 10.4 to 13.1% by weight
F: 0.4 to 1.4% by weight
TiO_2: 0.0 to 0.5% by weight
CeO_2: 0.2 to 1.2% by weight
ZnO: 0.0 to 5.0% by weight
BaO: 0.0 to 7.0% by weight
SrO: 15.0 to 22.0% by weight
ZrO_2: 6.3 to 10.3% by weight
$ZnO+BaO+SrO+ZrO_2$: 32.0 to 36.5% by weight
Sb_2O_3: 0.3 to 0.5% by weight.

4,599,320

REFRACTORY LINING MATERIAL FOR ELECTROLYTIC REDUCTION CELL FOR ALUMINUM PRODUCTION AND METHOD OF MAKING THE SAME

Martin R. Reeve, Beaconsfield, and Adam J. Gesing, Kingston, both of Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Dec. 27, 1983, Ser. No. 565,861

Claims priority, application United Kingdom, Dec. 30, 1982, 8236931

Int. Cl.[4] C04B *35/58;* **B01D** *39/06*

U.S. Cl. 501—96 **9 Claims**

1. A method of making a composite refractory material containing a proportion of transition metal diboride particles characterized by establishing a body of molten aluminium containing suspended transition metal diboride particles, filtering said molten aluminium by passing it through a body of a refractory substance other than said transition metal diboride, said refractory substance being inert with respect to aluminium metal and the transition metal diboride and insoluble in aluminium metal, to deposit said transition metal diboride particles on and in said body of refractory substance, and then subjecting the refractory substance carrying the transition metal diboride particles to a sintering operation.

4,599,321

PROCESS FOR THE MANUFACTURE OF SPHERICAL BODIES BY SELECTIVE AGGLOMERATION

Andrew Rainis, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 15, 1985, Ser. No. 691,645

Int. Cl.[4] B01J *35/08*

U.S. Cl. 502—8 **23 Claims**

1. A process for producing solid substantially spherical agglomerates of substantially inorganic material, which process comprises:

(a) mixing at high speed a portion of an inorganic material in the form of hydrophilic micron-sized particles in a water-immiscible liquid thereby forming a dispersion;

(b) gradually adding to said dispersion an aqueous phase while continuing said high speed mixing until substantially spherical hydrous micro-agglomerates form within said water immiscible liquid;

(c) subjecting said micro-agglomerates in a vessel having a hydrophobic inner surface to agitation at a speed low enough to achieve uniformly sized substantially spherical agglomerates;

(d) separating said agglomerates obtained from said water-immiscible liquid; and

(e) drying said agglomerates to produce hardened uniformly sized substantially spherical agglomerates having a diameter of between about 1 and 5 mm.

4,599,322

METHOD FOR PRODUCING KETONES AND PHENOLS

Charles A. Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 570,106, Jan. 12, 1984, Pat. No. 4,532,360. This application Mar. 7, 1985, Ser. No. 709,272

Int. Cl.[4] B01J *27/14, 27/08*

U.S. Cl. 502—150 **10 Claims**

1. A catalyst composition suitable for producing ketones and phenols from alkyl substituted benzenes comprising hydrogen bromide and a yield increasing and selectivity increasing compound, present in a yield increasing and selectivity increasing amount of the group consisting of boron phosphate, triphenylborate, and cerium oxide.

4,599,323

CATALYTIC SYSTEM FOR THE HYDROFORMYLATION OF OLEFINS PROCESS OF HYDROFORMYLATION

Claude Demay, Voisins le Bretonneux, and Claude Bourgeois, Montigny le Bretonneux, both of France, assignors to CDF Chimie Specialites, Paris, France

PCT No. PCT/FR84/00115, § 371 Date Dec. 24, 1984, § 102(e) Date Dec. 24, 1984, PCT Pub. No. WO84/04299, PCT Pub. Date Nov. 8, 1984

PCT Filed Apr. 24, 1984, Ser. No. 694,556

Claims priority, application France, Apr. 22, 1983, 83 06649

Int. Cl.[4] B01J *31/20*

U.S. Cl. 502—161 7 Claims

1. A catalyst system consisting essentially of a complex combination (1) of rhodium, carbon monoxide and a triarylphosphine or triarylphosphite ligand, a compound (2) of cobalt and a triarylphosphine or triarylphosphite compound (3) wherein said system contains a source of at least one conjugated diene (4).

4,599,324

V1-VASOPRESSIN ANTAGONISTS

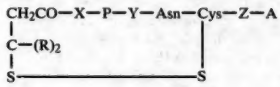
Fadia E. Ali, Cherry Hill, N.J., and William F. Huffman, Malvern, Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Nov. 21, 1984, Ser. No. 673,828

Int. Cl.[4] C07K *7/16;* A61K *37/34*

U.S. Cl. 514—11 11 Claims

1. A polypeptide compound having the formula:



in which:

P is Phe, Ile, Phe(4'-Alk), Tyr or Tyr(Alk);

X is a D or L isomer of Val, Nva, Leu, Ile, Pba, Phe, Phe(4'-Alk), Trp, Nle, Cha, Abu, Met, Chg, Tyr or Tyr(Alk);

Y is Val, Ile, Abu, Ala, Chg, Gln, Lys, Cha, Thr, Nle, Phe, Leu or Gly;

Z is a D or L isomer of Arg, Harg, Leu, Lys or Orn;

A is Gly(NH_2), Gly, Gly(NH-Alk), OH, NH_2 or NHAlk; and

R is, each, hydrogen or methyl, each of said Alk groups being a lower alkyl of 1–4 carbons, or a pharmaceutically acceptable salt thereof.

4,599,325

SUBSTITUTED TYROSYL ALANINE DIPEPTIDE AMIDES

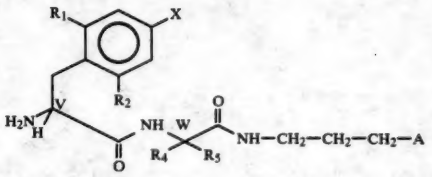
Donald W. Hansen, Jr.; Robert H. Mazur, both of Chicago, and Daniel R. Pilipauskas, Glenview, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 580,977, Feb. 16, 1984, abandoned. This application Jan. 22, 1985, Ser. No. 692,611

Int. Cl.[4] A61K *37/24;* C07K *7/12*

U.S. Cl. 514—19 26 Claims

1. A compound having the formula



and the pharmaceutically acceptable acid addition salts thereof wherein R_1 and R_2 are lower alkyl having 1 to 4 carbons, R_4 and R_5 may be the same or different and represent hydrogen, or lower alkyl having 1 to 6 carbons; X represents a hydrogen, hydroxy or $—OCO_2R_1$ substituent; A represents cyclohexyl, phenyl or phenyl substituted with one or more of lower alkyls having 1 to 6 carbons or lower alkoxy having 1 to 6 carbons, one or more amino, hydroxy, halogen or nitro substituents; V represents the asymmetric carbon that may be racemic or have optionally the D or L configuration; W represents the asymmetric carbon when R_4 and R_5 are not the same that may be racemic or have the D or L configuration.

4,599,326

ACETYL ERYTHROMYCIN STEARATE, AND COMPOSITIONS CONTAINING IT

Martti L. A. Marvola; Esko V. Marttila, both of Helsinki; Jaakko A. Uotila; Aino K. Pippuri, both of Espoo; Pekka J. Kairisalo, Helsinki, and Erkki J. Honkanen, Vantaa, all of Finland, assignors to Orion-yhtymä Oy, Espoo, Finland

Filed Dec. 27, 1984, Ser. No. 686,753

Claims priority, application Denmark, Jan. 6, 1984, 58/84

Int. Cl.[4] A61K *31/70;* C07H *17/08*

U.S. Cl. 514—29 3 Claims

2. An antibiotic composition, comprising about 196.5 mg to about 393 mg acetyl erythromycin stearate as well as one or more ingredients selected from the group: liquid or solid carriers, fillers, lubricants and other ancillary or additive ingredients.

4,599,327

DIBENZO[BD]PYRAN DERIVATIVES, PROCESS FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Mihály Nógrádi; Dezsö Korbonits; Ágnes Gottsegen; Sándor Antus; Zsuzsa Fürst; József Knoll; József Szejtli; Ágnes Stadler; Gábor Kovács, all of Budapest, and Katalin Mármarosi, Biatorbágy, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT, Budapest, Hungary

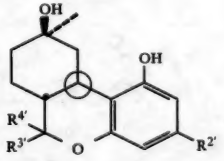
Filed Dec. 2, 1983, Ser. No. 557,629

Claims priority, application Hungary, Dec. 3, 1982, 2251/3884

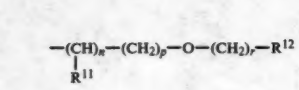
Int. Cl.[4] A61K *31/70;* C08B *37/16*

U.S. Cl. 514—58 8 Claims

1. A 2,6-di-O-methyl-beta-cyclodextrin-complex of a compound of the Formula (Ia)



wherein $R^{2'}$ stands for C_1–C_{12} alkyl or a group of the Formula



in which

R^{11} is C_1–C_4 alkyl;

R^{12} is hydrogen or C_1–C_4 alkyl;

n is 0 or 1;

p is 1 to 4;

r is 1 to 4; and

$R^{3'}$ and $R^{4'}$ are each C_1–C_4 alkyl, or a pharmaceutically acceptable salt thereof.

7. An analgesic composition containing as active ingredient a therapeutically effective amount of the 2,6-di-O-methyl-62-cyclodextrin complex of compounds of the formula I or pharmaceutically acceptable salts thereof as defined in claim 1, along with a pharmaceutically acceptable inert carrier.

8. An analgesic method of treatment which comprises the step of administering to an animal subject in need of said treatment an analgesically effective amount of the 2,6-di-O-methyl-betl-cyclodextrin complex of the compound of the Formula (1a) as defined in claim 1, or a pharmaceutically acceptable salt thereof.

4,599,328
THERAPEUTIC AND PREVENTIVE AGENT CONTAINING DOLICHOL

Isao Yamatsu; Takeshi Suzuki, both of Ushiku; Shinya Abe, Kukizaki; Kouji Nakamoto, Tsuchiura; Akiharu Kajiwara, Yatabe; Kouichi Katayama, Sakuramura; Hajime Tsunoda; Manabu Murakami, both of Toyosato; Hideki Ono, Sakura, and Kouji Yamada, Toride, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

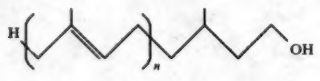
Filed Dec. 21, 1984, Ser. No. 684,871

Claims priority, application Japan, Dec. 26, 1983, 58-244228

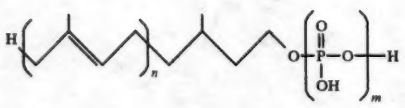
Int. Cl.[4] A61K *31/66, 31/035*

U.S. Cl. 514—106 **4 Claims**

1. A method of treating diabetes which comprises administering to a diabetic subject requiring such treatment, a therapeutically effective amount of a diabetes treating composition comprising a pharmaceutical carrier and an effective amount of at least one dolichol substance selected from the group consisting of compounds having the formulas



and



wherein n is an integer of 14 to 24, and m is an integer of 1 to 3.

4,599,329
O,S-DIALKYL S-[CARBAMYLOXYALKYL] DITHIOPHOSPHATES AND THEIR USE AS PESTICIDES

Walter Seufert, Speyer; Hans-Peter Loeffler, Ludwigshafen; Ulrich Schirmer, Heidelberg; Wolfgang Seppelt, Bobenheim-Roxheim, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

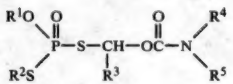
Filed Jan. 13, 1984, Ser. No. 570,456

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1983, 3302095

Int. Cl.[4] A01N *57/02;* **C07F** *9/165*

U.S. Cl. 514—119 **5 Claims**

1. An O,S-dialkyl S-[carbamyloxyalkyl]-dithiophosphate of the formula



(I)

where, independently of one another, R^1 and R^2 each represent alkyl of not more than 4 carbon atoms and R^3, R^4 and R^5 each represent hydrogen or alkyl of not more than 6 carbon atoms, or R^4 and R^5, together with the nitrogen atom to which they are bonded, form a saturated or olefinically unsaturated ring which contains not more than 6 carbon atoms and may or may not contain one or more oxygen, sulfur or nitrogen atoms.

2. A process for combatting insects or mites which comprises: contacting the insects or mites or their habitat with an effective amount of a compound of the formula I as defined in claim 1.

4,599,330
METHOD OF TREATING MILK FEVER

Alfred Boris, Parsippany; John J. Partridge, and Milan R. Uskokovic, both of Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 17, 1982, Ser. No. 379,385

Int. Cl.[4] A61K *31/59*

U.S. Cl. 514—167 **10 Claims**

1. A method for the prevention of milk fever in ruminant animals which comprises administering to a pregnant ruminant animal an effective amount of 24,24-difluoro-1α,25-dihydroxycholecalciferol prior to parturation.

4,599,331
ETIANIC ACIDS AS ANTIANGIOGENICS

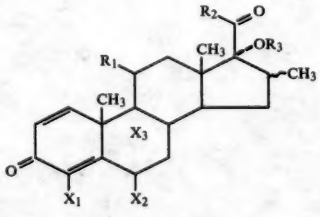
Alain B. Schreiber, Sunnyvale; William J. Kowalski, and Stefan H. Unger, both of Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Dec. 24, 1984, Ser. No. 685,568

Int. Cl.[4] A61K *31/56*

U.S. Cl. 514—179 **10 Claims**

1. A method for inhibiting angiogenesis in animals comprising administering a pharmaceutically acceptable formulation containing a compound of the formula



where X_1, X_2 and X_3 can be the same or different and can be hydrogen, fluorine and chlorine;

R_1 is chosen from the group consisting of hydrogen and hydroxyl;

R_2 is chosen from the group consisting hydrogen, methoxy and thiomethyl; and

R_3 is chosen from the group consisting of alkyl groups having less than 6 carbon atoms.

4,599,332

4,5-DIHYDRO-6-[2-[4-(1H-IMIDAZOL-1-YL)PHENYL]-ETHENYL]-3(2H)-PYRIDAZINONES AND RELATED COMPOUNDS

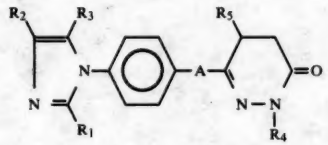
Ila Sircar, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 559,161, Dec. 7, 1983, abandoned. This application Nov. 9, 1984, Ser. No. 669,323

Int. Cl.[4] **C07D** *403/10;* **A61K** *31/50*

U.S. Cl. 514—247 **12 Claims**

1. A compound of the formula



wherein ═══ is a single or double bond; R_1, R_2 and R_3 are each independently hydrogen, lower alkyl, hydroxyl lower alkyl or R_2 and R_3 when taken together may form a ring containing five to seven carbon atoms or a benzene ring; R_4 and R_5 are each independently hydrogen or lower alkyl; A is alkylene of one to four carbon atoms or alkenylene of two to four carbon atoms, or a pharmaceutically acceptable acid addition salt thereof.

4,599,333

HYDRAZINOPYRIDAZINE COMPOUND, PROCESS FOR PRODUCTION THEREOF, AND USE THEREOF AS MEDICAMENT

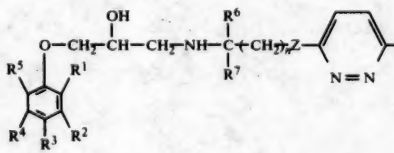
Kikuo Yasuda, Yokohama; Takayuki Takezaki, Kawasaki; Rikio Ohuchi, Kawasaki; Hiroshi Ohuyabu, Kawasaki; Yoshitaka Tanimoto, Yokohama; Toshimi Seki, Kawasaki; Takashi Yamaguchi, Yokohama; Akihiro Izumi, Machida; Norio Himori, and Tsutomu Ishimori, both of Kawasaki, all of Japan, assignors to Teikoku Hormone Mfg. Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 388,476, Jun. 14, 1982, abandoned. This application Mar. 22, 1984, Ser. No. 591,904

Int. Cl.[4] **C07D** *237/20, 237/22;* **A61K** *31/50*

U.S. Cl. 514—247 **11 Claims**

1. A hydrazinopyridazine compound represented by the formula:



(I)

wherein

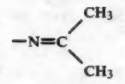
R^1 represents a hydrogen atom; a halogen atom; a cyano group; a C_1–C_5 alkyl group which may optionally be substituted by a halogen atom, a C_1–C_5 alkoxy or tetrahydrofurfuryloxy group; a C_1–C_5 alkoxy group which may optionally be substituted by a C_1–C_5 alkoxy group; an allyl group; an allyloxy group; or an ethynyl group;

R^2 represents a hydrogen, a halogen atom, a C_1–C_5 alkyl group, a C_1–C_5 alkoxy group, or an allyl group,

R^3, R^4, and R^5, independently from each other, represent a hydrogen atom, a halogen atom, or a C_1–C_5 alkyl group which may optionally be substituted by a C_1–C_5 alkoxy group,

R^6 and R^7, both represent a methyl group,

Y represents —NH_2, —NH—$COOC_2H_5$, or



Z represents —O—, —S—, or

in which R^8 represents a hydrogen atom or a C_1–C_5 alkyl group, and

n is 1 or 2

or its salt

with the proviso that at least three of R_1, R_2, R_3, R_4 and R_5 are hydrogen atoms, said alkyl groups are straight chain alkyl groups and the alkyl groups in said alkoxy groups are straight chain alkyl groups.

4,599,334

7-(3-ARYL-1-PIPERAZINYL)- AND 7-(3-CYCLOHEXYL-1-PIPERAZINYL)-3-QUINOLONECARBOXYLIC ACID ANTIBACTERIALS

Uwe Petersen; Klaus Grohe, both of Leverkusen; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

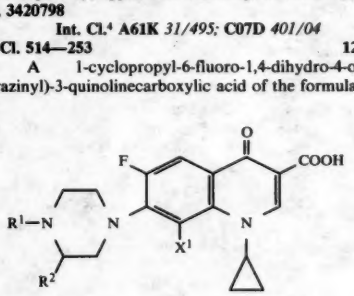
Filed May 17, 1985, Ser. No. 735,493

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1984, 3420798

Int. Cl.[4] **A61K** *31/495;* **C07D** *401/04*

U.S. Cl. 514—253 **12 Claims**

1. A 1-cyclopropyl-6-fluoro-1,4-dihydro-4-oxo-7-(1-piperazinyl)-3-quinolinecarboxylic acid of the formula



in which

R^1 is hydrogen, alkyl with 1 to 4 carbon atoms and optionally substituted by hydroxyl, methoxy, amino, dimethylamino, halogen, cyano or alkoxycarbonyl having 1 or 2 carbon atoms in the alkyl moiety, or is oxoalkyl having up to 4 carbon atoms, phenacyl, or acyl having 1 to 4 carbon atoms,

R^2 is phenyl or cyclohexyl optionally substituted up to three times by halogen, methyl, phenyl, cyano, hydroxyl, methoxy, benzyloxy, amino, methylamino, dimethylamino, piperidino or nitro, or is methylenedioxyphenyl, methylenedioxycyclohexyl, furyl, tetrahydrofuryl or thienyl, and

X^1 is hydrogen or fluorine,

or a pharmaceutically utilizable hydrate, acid addition salt, alkali metal or alkaline earth metal salt thereof.

11. A method of combating bacteria which comprises applying to such bacteria or to a host from which it is desired to exclude such bacteria an antibacterially effective amount of a compound, hydrate or salt according to claim **1**.

4,599,335

DIAMINE DERIVATIVES, COMPOSITIONS AND USE

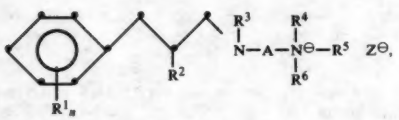
Costin Rentzea, Heidelberg; Ernst Buschmann, Ludwigshafen; Norbert Meyer, Ladenburg; Eberhard Ammermann, Ludwigshafen, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 492,341, May 6, 1983, abandoned. This application Jul. 31, 1985, Ser. No. 761,339

Int. Cl.[4] **A01N** *33/12, 43/60;* **C07C** *87/46;* **C07D** *295/02*

U.S. Cl. 514—255 **9 Claims**

1. A diamine derivative of the formula



I

wherein

R^1 is unsubstituted or halogen-substituted C_4–C_8 tertiary alkyl when n=1, or C_4–C_8 tertiary alkyl and halogen when n=2,

R^2 is C_1–C_3 alkyl,

A is C_2–C_4 alkylene which is unsubstituted or substituted by C_1–C_3 alkyl or is C_5–C_7 cycloalkylene which is unsubstituted or substituted by C_1–C_3 alkyl,

R^3 is C_1–C_2 alkyl,

R^4 and R^5 independently of one another are each unsubstituted or halogen substituted C_1–C_3 alkyl, C_3–C_5 alkenyl, propargyl or benzyl which is unsubstituted or substituted by C_1–C_4 alkyl or halogen, or

R^3 and R^4 together with A and the two nitrogen atoms which are bonded to A, form an unsubstituted or C_1–C_2 alkyl-substituted piperazine ring,

R_6 is C_1–C_8 alkyl C_3–C_5 alkenyl propargyl, unsubstituted, halogen or C_1–C_4 alkyl mono- to trisubstituted benzyl, phenylethyl or unsubstituted or halogen or C_1–C_4 alkyl mono- to trisubstituted phenoxyethyl, 4(tert-butyl) phenyl isobutyl, or phenylpropenyl, and

Z is an anion of any non-phytotoxic acid, with the proviso that not more than 2 of R^4, R^5 and R^6 are methyl.

6. A fungicidal and/or bactericidal agent which comprises: an inert carrier and from 0.1 to 95% by weight of a diamine as defined in claim **1**.

4,599,336

DERIVATIVES OF (E)-3-(4-OXO-4H-QUINAZOLIN-3-YL)-2-PROPENAMIDE

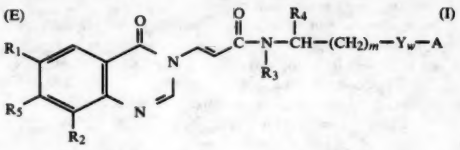
Matthew Carson, Nutley; Ronald A. Le Mahieu, North Caldwell; William C. Nason, Mountain Lakes, and Jefferson W. Tilley, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 8, 1983, Ser. No. 521,308

Int. Cl.[4] **A61K** *31/505;* **C07D** *401/12*

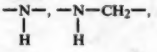
U.S. Cl. 514—259 **28 Claims**

24. A method of treating an allergic condition which comprises administering to a host in need thereof an effective amount of a compound of the formula



(E) (I)

wherein R_1 is hydrogen, lower alkyl, lower cycloalkyl, lower alkoxy, hydroxy, halo, lower akylthio, lower alkylsulfinyl, lower alkylsulfonyl, di-$(C_1$–$C_7)$alkyl—$N(CH_2)_nO$— or 2-hyroxyethoxy; n is 2 to 7; R_2 is hydrogen, lower alkyl or lower alkoxy; R_3 is hydrogen or methyl; R_4 is hydrogen or lower alkyl; R_5 is hydrogen or lower alkyl provided however if R_2 is other than hydrogen R_5 is hydrogen; m is 1 to 7; Y is



—O— or —S—; w is zero or one; and A is an aromatic 5- or 6-membered heterocyclic radical having 1 to 2 heteroatoms which may be the same or different and are selected from the group consisting of nitrogen, oxgen and sulfur, and wherein the 3-pyridinyl radical may have an N-methyl group;

or a pharmaceutically acceptable addition salt thereof.

4,599,337

ANTIPHLOGISTIC/ANTIPYRETIC/ANALGESIC AGENTS CONTAINING THEOBROMINE OR THEOPHYLLINE DERIVATIVES AS ACTIVE INGREDIENT

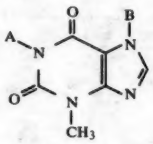
Takeru Kaneko, Saitama; Satoru Ozaki, Hoya; Kimie Takizawa, Narashino, and Hachiro Sugimoto, Ushiku, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Division of Ser. No. 471,564, Mar. 2, 1983, Pat. No. 4,543,253. This application Jul. 16, 1985, Ser. No. 755,404

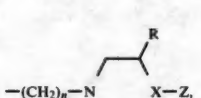
Int. Cl.[4] **A61K** *31/52*

U.S. Cl. 514—265 **12 Claims**

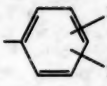
1. A method for treating a subject suffering from at least one of the symptoms of pain, fever, and tissue and/or bone and joint inflammation, which comprises administering to the subject a pharmaceutical composition which comprises a therapeutically effective amount of at least one compound of the general formula:



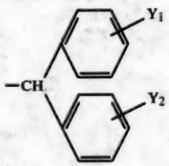
wherein one of A and B is $—CH_3$ and the other of A and B is



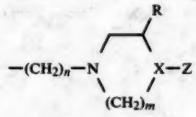
wherein R is a hydrogen atom or a lower alkyl group, Z is selected from the group consisting of (1) a group of the formula



wherein X_1 and X_2 are the same or different and each represents a hydrogen atom, a lower alkyl group, a lower alkoxy group, a trifluoromethyl group or a halogen atom; (2) a pyridyl group; and (3) a group of the formula:



wherein Y_1 and Y_2 are the same or different and Y_1 and Y_2 are selected from the group consisting of a hydrogen atom, a lower alkyl group, a lower alkoxy group, a trifluoromethyl group and a halogen atom, X is a nitrogen atom or a carbon atom, m is 2 or 3, and n is an integer of from 2 to 10, with the provisos that (i) when A is $-CH_3$, m is 2, (ii) when A is



Z is not pyridyl and X is nitrogen and (iii) when X is nitrogen, m is 3, and acid addition salts thereof, for analgesic, antiphlogistic, and antipyretic purposes, in combination with a pharmaceutically effective carrier.

4,599,338

ANTIMIGRAINE 8-[3-(4-AMINOCARBONYL PIPERAZINO AND PIPERIDINO) PROPYL[XANTHINES

Gilbert Regnier, Chatenay Malabry; Claude Guillonneau, Clamart; Jacques Duhault, Croissy Sur Seine, and Francois Roman, Courbevoie, all of France, assignors to Adir, S.A.R.L., Neuilly-sur-Seine, France

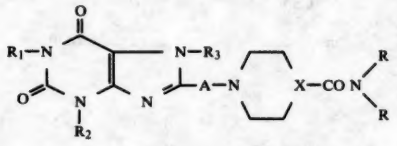
Filed Jan. 16, 1985, Ser. No. 692,049

Claims priority, application France, Jan. 17, 1984, 84 00659

Int. Cl.[4] A61K *31/52*; C07D *473/06*

U.S. Cl. 514—265 **8 Claims**

1. A compound selected from the group consisting of xanthine compounds of the formula:



in which:

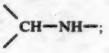
R_1 is selected from the group consisting of hydrogen and (C_1–C_5) alkyl, in straight and branched chain;

R_2 is selected from the group consisting of hydrogen, (C_1–C_5) alkyl radicals in straight and branched chain and these radicals having a double bond, and benzyl

R_3 is selected from the group consisting of hydrogen and methyl;

A is selected from the group consisting of polymethylene chains $(CH_2)_n$ in which n is an integer from 1 to 4 inclusive, and such chains substituted, when n is higher than 1, by hydroxy;

X is selected from the group consisting of nitrogen and



the substituents R are each selected from the group consisting of alkyl radicals having from 1 to 5 carbon atoms inclusive or are joined together in order to form with the nitrogen atom to which they are bonded a piperidino or morpholino radical; and, physiologically tolerable acid addition salts thereof.

6. A method for treating a living animal body afflicted with migraine comprising the step of administering to the said living animal an amount of a compound of claim 1 which is effective for the alleviation of the said condition.

4,599,339

USE OF PYRIMIDO[4,5-G]QUINOLINES IN TREATING PARKINSONISM

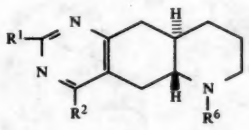
Cynthia L. Nichols, and Edmund C. Kornfeld, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 535,503, Sep. 26, 1983, Pat. No. 4,501,890. This application Nov. 1, 1984, Ser. No. 667,307

Int. Cl.[4] A61K *31/505*

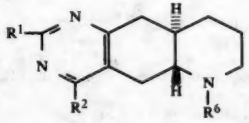
U.S. Cl. 514—267 **8 Claims**

1. A method of treating Parkinson's Syndrome consisting of administration to a mammal suffering from Parkinson's Syndrome and in need of treatment an effective dose of a drug of the formula



in which R^1 is NH_2, $NHCH_3$, $N(CH_3)_2$, NH—CO—CH_3 or NH—CO-phenyl, R^2 is H, Cl, Br or CH_3 and R^6 is C_{1-3} alkyl or allyl, or a pharmaceutically-acceptable addition salt thereof.

4. A method of treating depression in mammals which consists of administering to a mammal in a depressed state, a depression alleviating dose of a compound of the formula



in which R^1 is NH_2, $NHCH_3$, $N(CH_3)_2$, NH—CO—CH_3 or NH—CO-phenyl, R^2 is H, Cl, Br or CH_3 and R^6 is C_{1-3} alkyl or allyl, or a pharmaceutically-acceptable acid addition salt thereof.

4,599,340

ENHANCED SOFT TISSUE FLAP SURVIVAL IN RECONSTRUCTIVE SURGERY

Lester Silver, Englewood, N.J., and Barry Goldenberg, New York, N.Y., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed May 7, 1985, Ser. No. 731,363
Int. Cl.[4] A61U *31/55, 31/135, 31/275, 31/435, 31/495*
U.S. Cl. 514—277 6 Claims

1. A method for reducing soft tissue flap necrosis in a patient undergoing reconstructive surgery which comprises administering to such patient an effective amount of a calcium channel blocking drug or a pharmaceutically acceptable non-toxic salt thereof to reduce said necrosis of said flap.

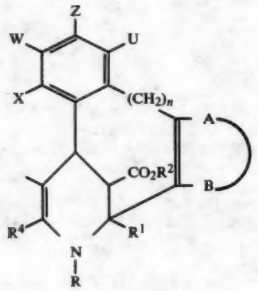
4,599,341

SUBSTITUTED AND BRIDGED PYRIDINES USEFUL AS CALCIUM CHANNEL BLOCKERS

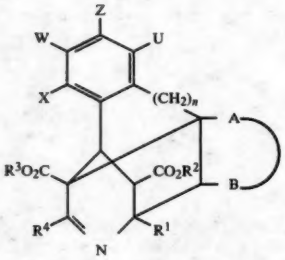
Wasyl Halczenko, Hatfield, and George D. Hartman, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 1, 1984, Ser. No. 655,778
Int. Cl.[4] A61K *31/44, 31/47;* C07D *491/08*
U.S. Cl. 514—282 9 Claims

1. A compound represented by the following general structure formulae (I) or (II):



(I)



(II)

wherein:

n is 0 or 1;

A is oxygen or sulfur and B is —CH=CH—; or

B is oxygen or sulfur and A is —CH=CH—; and

R is hydrogen;

R^1 and R^4 independently are hydrogen or C_1–C_8 alkyl;

R^2 and R^3 independently are C_1–C_8 alkyl or C_1–C_8 aminoalkyl wherein the amino group is NR^7R^8 in which R^7 and R^8 independently are hydrogen, C_1–C_8 alkyl or C_7–C_{14} phenylalkyl; and

X, W, Z and U independently are hydrogen, C_1–C_8 alkoxy, CF_3, cyano, nitro or halo provided that at least two of X, W, Z and U are hydrogen.

7. A pharmaceutical composition, useful in the treatment of cardiovascular disorders in which a high cellular concentration of Ca^{++} is a factor, comprising a nontoxic therapeutically effective amount of a compound according to claim 1 in an admixture with a pharmaceutically acceptable carrier.

8. A method of treatment for cardiovascular disorders in which a high cellular concentration of Ca^{++} is a factor which comprises administering to a subject in need of such of such treatment a nontoxic therapeutically effective amount of a compound according to claim 1.

4,599,342

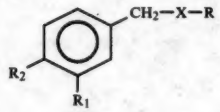
PHARMACEUTICAL PRODUCTS PROVIDING ENHANCED ANALGESIA

Thomas R. LaHann, Cleves, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

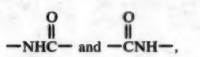
Filed Jan. 16, 1984, Ser. No. 571,048
Int. Cl.[4] A61K *31/44, 31/16, 31/165*
U.S. Cl. 514—282 25 Claims

1. An analgesic composition comprising a safe and effective amount of:

(a) an analgesic compound of the formula



wherein R_1 is selected from the group consisting of OH and OCH_3, R_2 is OH, X is selected from the group consisting of



and R is selected from the group consisting of a C_5–C_{11} alkyl, C_5–C_{11} alkenyl, C_{11}–C_{23} cis alkenyl, C_{11}–C_{23} alkynyl, C_{11}–C_{23} alkadienyl and C_{11}–C_{23} methylene substituted alkane;

(b) an analgesic opioid selected from the group consisting of morphine, oxycodone, derivatives thereof, salts thereof and mixtures thereof; and

(c) a pharmaceutically-acceptable carrier; wherein the weight ratio of (a):(b) is from about 20,000:1 to about 1:20.

4,599,343

PERFLUOROINDOLIZINES AND EMULSIONS THEREOF USEFUL AS BLOOD SUBSTITUTES

Kazumasa Yokoyama, Toyonaka; Chikara Fukaya, Osaka; Yoshio Tsuda, Takarazuka; Taizo Ono, Osaka; Yoshio Arakawa, Suita, and Tadakazu Suyama, Kyoto, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

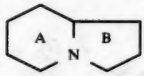
Division of Ser. No. 454,108, Dec. 28, 1982, Pat. No. 4,526,929.
This application Nov. 13, 1984, Ser. No. 670,969
Int. Cl.[4] A61K *31/40;* C07D *486/06*
U.S. Cl. 514—299 4 Claims

1. A perfluoroindolizine compound of the formula:

in which either the A ring, the B ring, or both are substituted with at least one C_1 to C_3 perfluoroalkyl group provided that the total number of carbon atoms in the perfluoroindolizine compound is from 8 to 12.

3. An emulsion useful as a blood substitute containing a perfluorobicyclo compound capable of carrying oxygen, said emulsion comprising:

5-50% (w/v) of a perfluoroindolizine compound of the formula:



in which the A ring, the B ring, or both are substituted with at least one C_1 to C_3 perfluoroalkyl group provided that the total number of carbon atoms in the perfluoroindolizine compound is from 8 to 12,

as an oxygen-carrying component;

1-5% (w/v) of an emulsifying agent, and

a physiologically acceptable aqueous solution as the balance, the emulsion having a particle diameter of 0.3μ or less.

4,599,344

QUINUCLIDINES AND QUINUCLIDINIUM SALTS AS ANTIARRHYTHMIC AGENTS

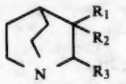
Thomas K. Morgan, Jr., Morris Plains, N.J., assignor to Schering A.G., Berlin, Fed. Rep. of Germany

Filed Oct. 31, 1984, Ser. No. 666,788

Int. Cl.[4] A61K *31/445;* **C07D** *453/02*

U.S. Cl. 514—305 **39 Claims**

1. A compound of the formula I:



I

wherein

R_1 is H or OH;

R_2 is H or ALK—Z;

R_1, R_2 taken together form =O or =CH—ALK′—Z;

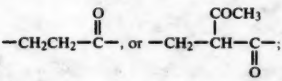
R_3 is H or —ALK″—Z;

where

ALK is a straight chain alkyl of 2-4 carbon atoms;

ALK′ is a straight chain alkyl of 1-3 carbon atoms;

ALK″ is a straight chain alkyl of 1-4 carbon atoms,



Z is

where X and Y are the same or independently hydrogen, halogen, hydroxyl, loweralkyl, loweralkoxy, amino, cyano, nitro, loweralkanecarboxamido, loweralkanesulfonamido, carbamoyl, loweralkylcarbamoyl, loweralkylsulfonyl, sulfamoylamino, N-loweralkylsulfamoyl, trifluoromethanesulfonamido, ureido or N-loweralkylureido;

with the provisos that:

(a) X and Y cannot both be hydrogen,

(b) R_2 and R_3 cannot both be hydrogen,

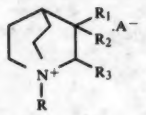
(c) when R_3 is —ALK″—Z wherein the ALK″ is —CH$_2$—CH(COCH$_3$)—CO— or —CH$_2$CH$_2$CO— then together R_1 and R_2 must be =O,

(d) when R_3 is —ALK″—Z wherein the ALK″ is a straight chain alkyl of 1-4 carbon atoms then R_2 cannot be —ALK—Z, and R_1, R_2 together cannot be =CH—ALK′-Z,

(e) when R_1R_2 taken together form =O then R_3 cannot be hydrogen

or a pharmaceutically acceptable acid addition salt thereof;

or a quaternary ammonium salt thereof of the formula II



II

wherein

R_1, R_2, R_3 are as above, and

R is a straight or branched chain alkyl of 1-12 carbon atoms, cycloalkyl(lower)alkyl, phenyl(lower)alkyl, —CH$_2$-CHOHCH$_2$W, —(CH$_2$)$_m$—W or —(CH$_2$)$_m$SO$_3$H;

where

m is an integer of 1-5;

W is COO—V;

where V is hydrogen or a straight or branched chain alkyl of 1-4 carbon atoms,

with the proviso that when R is a straight or branched chain alkyl, the carbon atom alpha to the nitrogen is primary, and

A is an anion forming a pharmaceutically acceptable salt;

or the inner salt of formula II, formed when the anion A is

R when R is —CH—CHOH—CHCOO$^-$, —(CH$_2$-)$_m$—COO$^-$, or —(CH$_2$)$_m$SO$_3^-$

where m is as previously described.

39. The method of treating arrhythmias in a mammalian subject in need thereof comprising administering to said subject an antiarrhythmically effective dose of a compound according to claim **1**.

4,599,345

CHLOROMETHYL QUINOLINE DERIVATIVES AND USE THEREOF AS ANALGESICS

Zoltán Salamon; Ilona Imre née Virág, both of Tiszavasvari, and Magdolna Sebestyén, Hajdunanas, all of Hungary, assignors to Alkaloide Vegyeszeti Gyar, Tiszavasvari, Hungary

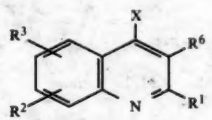
Filed Dec. 1, 1983, Ser. No. 557,106

Claims priority, application Hungary, Dec. 2, 1982, 3869/82

Int. Cl.[4] A61K *31/47;* **C07D** *215/12*

U.S. Cl. 514—311 **16 Claims**

1. A chlorinated quinoline derivative of formula (I)



(I)

wherein

R^1 is —CCl$_3$, —CF$_3$, —CHCl$_2$ or —CH$_2$Cl,

R^2 is hydrogen when R^3 is not hydrogen, or is halogen, C_{1-4} alkoxy, C_{1-4} alkyl or R^1,

R^3 is hydrogen when R^2 is not hydrogen or is halogen, C_{1-4} alkyl, C_{1-4} alkoxy or CF$_3$,

R^6 is hydrogen or halogen, and

X is halogen.

15. An antiphlogistic method of treatment which comprises the step of treating a susceptible subject with a therapeutically effective amount of the compound of the Formula (I) as defined in claim **1**.

4,599,346

PROPAN-2-OL DERIVATIVES, A PROCESS FOR THEIR PRODUCTION AND MEDICAMENTS CONTAINING THESE COMPOUNDS

Helmut Schickaneder, Eckental; Stefan Postius, Nuremberg; Rolf Herter, Schwabach; Peter Mörsdorf, Cadolzburg; Istvan Szelenyi, Schwaig, and Kurt H. Ahrens, Nuremberg, all of Fed. Rep. of Germany, assignors to Ludwig Heumann & Co., GmbH, Nuremberg, Fed. Rep. of Germany

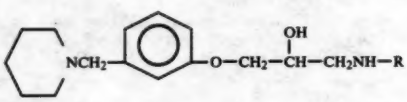
Filed Jul. 16, 1984, Ser. No. 630,963

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1983, 3326545

Int. Cl.[4] A61K *31/41, 31/445;* C07D *211/06, 417/12*

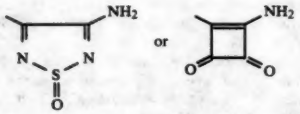
U.S. Cl. 514—317 2 Claims

1. A Propan-2-ol corresponding to the formula:



(I)

in which R represents



and salts thereof with pharmacologically acceptable acids.

2. A pharmaceutical composition for use in inhibiting the secretion of gastric acid and for the treatment of peptic ulcers and hyperacidic gastritis comprising as the principal active ingredient an effective amount of a propan-2-ol according to claim 1 in admixture with a pharamceutically acceptable carrier.

4,599,347

TETRAHYDRO-NAPHTH (2.3-D) IMIDAZOLE DERIVATIVES

Anna Krassó, Basel, and Henri Ramuz, Birsfelden, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

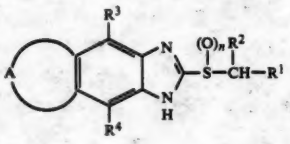
Division of Ser. No. 290,032, Aug. 5, 1981, Pat. No. 4,435,406. This application Dec. 12, 1983, Ser. No. 560,699

Claims priority, application Switzerland, Aug. 21, 1980, 6321/80

Int. Cl.[4] A61K *31/44;* C07D *401/12*

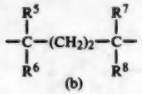
U.S. Cl. 514—338 16 Claims

1. A tricyclic imidazole of the formula



I

wherein R^1 is 2-pyridyl unsubstituted or substituted by lower alkyl or lower alkoxy, n is the integer 0 or 1, R^2 is hydrogen or lower alkyl, R^3 and R^4, independently, are hydrogen or lower alkyl, A is a group of the formula



(b)

R^5, R^6, R^7 and R^8, independently, are lower alkyl or a pharmaceutically acceptable acid addition salt thereof.

4,599,348

1-AZOLYL-SUBSTITUTED OXIME ETHER FUNGICIDES

Johannes Schmetzer, Pulheim; Jörg Stetter, Wuppertal; Paul Reinecke, and Gerd Hänssler, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

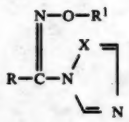
Filed Sep. 7, 1984, Ser. No. 648,910

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1983, 3334220

Int. Cl.[4] A01N *43/653;* C07D *249/08*

U.S. Cl. 514—383 10 Claims

1. A 1-axolyl-substituted oxime ether of the formula



in which

R is alkyl with 1 to 12 carbon atoms; alkoxyalkyl with 1 to 4 carbon atoms in each alkyl part; alkenyl or alkinyl with in each case 2 to 5 carbon atoms; cycloalkyl with up to 6 carbon atoms in the ring; aralkyl with 1 to 4 carbon atoms in the alkyl part, the aryl part containing 6 to 10 carbon atoms and being optionally substituted by halogen or by alkyl and/or alkoxy groups with in each case up to 4 carbon atoms; or phenyl or phenoxyalkyl with up to 3 carbon atoms in the alkyl part, the phenyl being optionally substituted by halogen or alkyl and/or alkoxy groups with in each case 1 to 4 carbon atoms,

R^1 is aralkyl with 1 to 3 carbon atoms in the alkyl part, the aryl part containing 6 to 10 carbon atoms and being optionally substituted by halogen or alkyl and/or alkoxy with in each case up to 4 carbon atoms; or heteroaralkyl with 1 or 2 carbon atoms in the alkyl part and a 5-membered aromatic hetero- ring with 1 to 3 nitrogen atoms and optionally an oxygen atom in the heteroaryl part, and

X is nitrogen or the CH group, or a physiologically acceptable addition product thereof with an acid or metal salt.

9. A method of combating fungi which comprises administering to such fungi or to a fungus habitat a fungicidally effective amount of a compound or addition product according to claim 1.

4,599,349

CARBAMOYLATED AZOLYLALKYL-PHENOXY-CARBINOLS AND THEIR USE AS PLANT-PROTECTION AGENTS

Gerhard Heywang, Bergisch-Gladbach; Paul Reinecke, Leverkusen; Wilhelm Brandes, Leichlingen; Gerd Haenssler, Leverkusen, and Ingeborg Hammann, Muehlheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

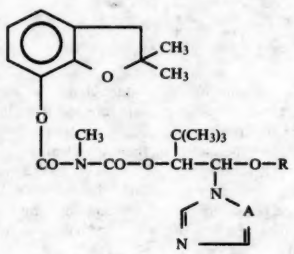
Filed Apr. 6, 1984, Ser. No. 597,777

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1983, 3315262

Int. Cl.[4] A01N *47/22;* C07D *405/12*

U.S. Cl. 514—383 5 Claims

1. A carbamoylated azolylalkylphenoxy-carbinol of the formula



in which

A is a nitrogen atom and

R is phenyl substituted by fluorine, chlorine, methyl or phenyl.

3. A fungicidal and insecticidal composition comprising a fungicidally and insecticidally effective amount of a compound according to claim 1 in admixture with a diluent.

4,599,350

NOVEL THIOLANE-2,4-DIONE-3-CARBOXAMIDE FUNGICIDES

Herbert Gayer, Monheim; Wilhelm Brandes, Leichlingen; Gerd Hänssler, and Paul Reinecke, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

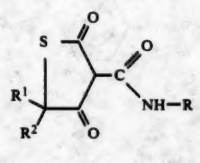
Filed Nov. 27, 1984, Ser. No. 675,159

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1983, 3344523; Jul. 27, 1984, 3427847

Int. Cl.[4] A01N *43/02;* C07D *333/32*

U.S. Cl. 514—445 13 Claims

1. A thiolane-2,4-dione-3-carboxamide of the formula



in which

R is alkyl, cycloalkyl, optionally substituted aralkyl or optionally substituted aryl, and

R^1 and R^2 each independently is hydrogen, alkyl, cycloalkyl, cycloalkylalkyl, aralkyl or aryl.

4,599,351

FUNGICIDAL 3-(N-ACYL-N-ARYLAMINO) LACTONES

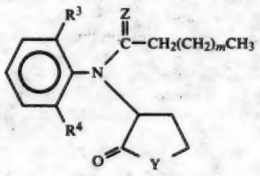
David C. K. Chan, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 292,774, Aug. 14, 1981, abandoned, which is a continuation-in-part of Ser. No. 210,919, Nov. 28, 1980, abandoned. This application Feb. 1, 1984, Ser. No. 575,971

Int. Cl.[4] C07D *307/32;* A61K *31/365*

U.S. Cl. 314—472 13 Claims

1. A method for the control of Grape Downy Mildew comprising contacting said mildew or its habitat with a fungicidally effective amount of a compound of the formula:



wherein R^3 and R^4 are independently alkyl having 1 to 4 carbon atoms; Y is oxygen; m is 1 or 2; and Z is oxygen or sulfur.

4,599,352

ANTINEOPLASTIC PLATINUM (IV) COMPLEXES AND COMPOSITIONS

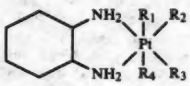
Venkatachala L. Narayanan, Gaithersburg; Mary K. Wolpert-Defilippes, and Rudiger D. Haugwitz, both of Bethesda, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Mar. 1, 1984, Ser. No. 585,111

Int. Cl.[4] A01N *55/02;* A61K *31/28;* C07F *15/00*

U.S. Cl. 514—492 13 Claims

1. A substantially isomerically pure tetrahalo (1,2-diaminocyclohexane) platinum (IV) complex of the following formula:



wherein R_1 R_2 R_3 and R_4 are the same or different substitutents selected from the group consisting of chlorine, bromine, iodine and fluorine.

4,599,353

USE OF EICOSANOIDS AND THEIR DERIVATIVES FOR TREATMENT OF OCULAR HYPERTENSION AND GLAUCOMA

Laszlo Z. Bito, New York, N.Y., assignor to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed May 3, 1982, Ser. No. 374,165

Int. Cl.[4] A61K *31/215*

U.S. Cl. 514—530 19 Claims

1. A method for treating hypertension or glaucoma in a primate subject's eye comprising periodically contacting the surface of the eye with an amount of an eicosanoid or an eicosanoid derivative effective to reduce intraocular pressure in the eye without any substantial initial increase in said pressure and to maintain reduced intraocular pressure.

13. A composition for topical treatment of glaucoma in the eye of a primate subject comprising an effective amount of $PGF_{2\alpha}$ methyl ester, $PGF_{2\alpha}$ ethyl ester, $PGF_{2\alpha}$ isopropyl

ester, or $PGF_{2\alpha}$ isobutyl ester dissolved in an ophthalmically compatible carrier.

4,599,354

COMPOSITION AND METHOD FOR PRODUCING PROLONGED PAIN RELIEF

Morton Shulman, 1115 Thorntree La., Highland Park, Ill. 60035

Filed Mar. 11, 1985, Ser. No. 710,416
Int. Cl.[4] A61K *31/24, 31/215, 31/745*
U.S. Cl. 514—530 **22 Claims**

1. A composition for producing lasting pain relief in a body region by injection, said composition consisting essentially of:

a sterile, stable suspension of butyl aminobenzoate in a non-toxic, aqueous carrying medium in which said butyl aminobenzoate is insoluble;

said butyl aminobenzoate constituting about 5 to 15 wt.% of said composition;

said aqueous carrying medium consisting essentially of water as the major constituent and polyethylene glycol in an amount sufficient to maintain said butyl aminobenzoate in suspension;

said suspension being substantially devoid of dextran.

4,599,355

TREATMENT OF SLEEP DISORDERS

Ronald Kluger, Don Mills, and Mortimer Mamelak, Willowdale, both of Canada, assignors to University of Toronto - Innovations Foundation, Toronto, Canada

Filed Aug. 6, 1984, Ser. No. 637,882
Claims priority, application Japan, Feb. 10, 1984, 59-23599
Int. Cl.[4] A61K *31/235*
U.S. Cl. 514—533 **3 Claims**

1. A process of treating sleep disorders in mammals, which comprises administering to a mammal an effective amount of a pharmaceutical composition containing as active ingredient a compound selected from ethyl 4-acetoxybutanoate; methyl 4-acetoxybutanoate; or methyl 4-benzoylbutanoate.

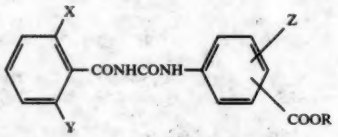
4,599,356

N-BENZOYL-N'-PHENYLUREAS AND THEIR USE FOR INSECT CONTROL

Arno Lange, Mannheim; Karl Kiehs, Lampertheim, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengeselischaft, Fed. Rep. of Germany

Continuation of Ser. No. 337,284, Jan. 5, 1982, abandoned. This application Nov. 28, 1983, Ser. No. 555,393
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1981, 3100911
Int. Cl.[4] A01N *37/10;* C07C *101/68*
U.S. Cl. 514—535 **5 Claims**

1. An N-benzoyl-N'-phenylurea of the formula



wherein X is chlorine or fluorine, Y is fluorine or hydrogen Z is chlorine or hydrogen and R is 2,4-dimethyl-pent-3-yl, 2,6-dimethylhept-4-yl or 2,2,4,4-tetramethyl-pent-3-yl.

4. An insecticidal agent containing inert additives and from 0.5 to 90% by weight of an N-benzoyl N'-phenylurea of the formula I as defined in claim 1.

5. A process for combating insects, wherein an insecticidally effective amount of an N-benzoyl-N'-phenylurea of the formula I as claimed in claim 1 is allowed to act on the insects and/or their habitat.

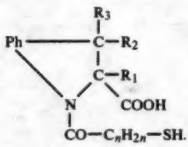
4,599,357

1-MERCAPTOALKANOYLINDOLINE-2-CARBOXYLIC ACIDS

James L. Stanton, Ossining, and Norbert Gruenfeld, White Plains, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 104,505, Dec. 17, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 219,140
Int. Cl.[4] A61K *31/40;* C07D *209/26*
U.S. Cl. 514—419 **11 Claims**

1. A 1-mercaptonalkanoylindoline-2-carboxylic acid compound of the formula:



wherein Ph is unsubstituted 1,2-phenylene, or 1,2-phenylene substituted by one or two members selected from lower alkyl, lower alkoxy, hydroxy, and halogeno, or 1,2-phenylene substituted by one member selected from lower alkylenedioxy and trifluoromethyl; each of R_1, R_2 and R_3 is hydrogen or lower alkyl; and n is an integer from 1 to 7; the S-lower alkanolyl or the S-HPh-carbonyl derivative thereof; the amide, the lower alkyl ester; or a pharmaceutically acceptable salt of said carboxylic acid.

9. An antihypertensive and cardioactive pharmaceutical composition comprising a correspondingly effective amount of a compound as claimed in claim 1, together with a pharmaceutical excipient.

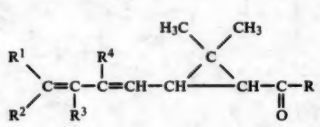
4,599,358

PYRETHROIDS

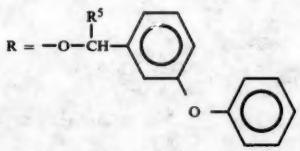
Enrico Bosone; Giuseppe Caprara; Francesco Corda, all of Milan; Franco Gozzo, San Donato Milanese; Augusto Menconi; Paolo Piccardi, both of Milan, and Vincenzo Caprioli, San Martino, all of Italy, assignors to Montedison, S.p.A., Italy

Filed Nov. 24, 1980, Ser. No. 209,589
Claims priority, application Italy, Nov. 26, 1979, 27542 A/79
Int. Cl.[4] A61K *31/275, 31/215;* C07C *121/50, 69/74*
U.S. Cl. 514—521 **22 Claims**

1. A compound having the formula:



wherein:



(R^5=H, CN, —C≡CH)
R^1=F, Cl, Br, CH_3, CF_3
R^2=F, Cl, Br, CF_3
R^3=H, F, Cl, Br, CF_3
R^4=H, F, Cl, Br, CF_3 or R^2 and R^3 together form a third

bond between the carbon atoms to which they are bonded.

4,599,359

HYDROXYZINE-CONTAINING ANALGESIC COMBINATIONS

Stephen A. Cooper, 85 Westview Rd., Short Hills, N.J. 07078, assignor to Stephen A. Cooper, Short Hills, N.J.

Continuation-in-part of Ser. No. 586,566, Mar. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 448,290, Dec. 9, 1982, abandoned. This application Nov. 7, 1984, Ser. No. 668,896

Int. Cl.[4] A61K *31/19*

U.S. Cl. 514—557 **34 Claims**

18. The method of relieving pain in a human subject comprising orally or rectally co-administering to said subject; (a) one or more arylpropionic acid non-steroidal anti-inflammatory/analgesic agents selected from the group consisting of ibuprofen, suprofen, carprofen, fenoprofen calcium, naproxen, naproxen sodium, indoprofen, ketoprofen and flurbiprofen; and (b) hydroxyzine or an acid salt form thereof in an amount sufficient to potentiate the analgesic action of component (a); said components (a) and (b) being co-administered in a total pain relieving effective amount.

4,599,360

OPHTHALMIC ANTI-INFLAMMATORY AGENTS

Masaharu Fukami; Atsusuke Terada, and Kazue Hasegawa, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

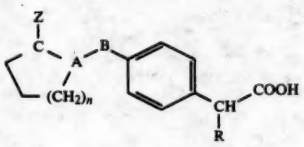
Filed Aug. 9, 1984, Ser. No. 639,376

Claims priority, application Japan, Aug. 10, 1983, 58-146147

Int. Cl.[4] A61K *31/19*

U.S. Cl. 514—570 **19 Claims**

1. A method for the treatment or prophylaxis of ocular inflammation comprising applying to the surface of the mammalian eye an anti-inflammatory effective amount of a phenylacetic acid derivative of the formula:



wherein:

R represents the hydrogen atom or the methyl group;

>A—B— represents a >CH—CH_2— or >C=CH— group;

>C—Z represents a >C=O (carbonyl) group or a >CH—OH group; and

n is 1 or 2;

or an ophthalmically acceptable salt or ester thereof.

4,599,361

HYDROXAMIC ACID BASED COLLAGENASE INHIBITORS

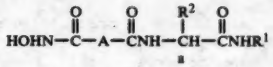
Jonathan P. Dickens; David K. Donald, both of High Wycombe; Geoffrey Kneen, West Wycombe, and William R. McKay, High Wycombe, all of England, assignors to G. D. Searle & Co., Skokie, Ill.

Filed Sep. 10, 1985, Ser. No. 774,491

Int. Cl.[4] C07C *83/10;* **A61K** *31/085, 31/165, 31/185*

U.S. Cl. 514—575 **11 Claims**

1. A compound of the formula



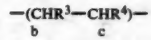
wherein

R^1 is C_1–C_6 alkyl;

R^2 is C_1–C_6 alkyl, benzyl, benzyloxybenzyl, (C_1–C_6 alkoxy)-benzyl or benzyloxy(C_1–C_6 alkyl);

a is a chiral center with optional R or S stereochemistry;

A is a



group or a —(CR^3=CR^4)— group wherein b and c are chiral centers with optional R or S stereochemistry; R^3 is hydrogen, C_1–C_6 alkyl, phenyl or phenyl(C_1–C_6 alkyl) and R^4 is hydrogen or C_1–C_6 alkyl, phenyl(C_1–C_6 alkyl), cycloalkyl or cycloalkyl(C_1–C_6 alkyl).

11. A method of promoting an antiarthritic effect in a mammal in need thereof comprising administering thereto a collagenase inhibiting effective amount of a compound according to claim 1.

4,599,362

2-ARYL-ETHYL ETHER DERIVATIVES AND INSECTICIDAL AND ACARICIDAL AGENTS CONTAINING SAID DERIVATIVES

Kiyoshi Nakatani, Tokyo; Satoshi Numata, Kanagawa; Tsuneo Inoue, Kanagawa; Akira Hosono, Kanagawa; Kengo Oda, Kanagawa; Yutaka Kubota, Kanagawa; Hajime Tachibana, Kanagawa; Takatoshi Udagawa, Kanagawa, and Masatoshi Gohbara, Kanagawa, all of Japan, assignors to Mitsuitoatsu Chemicals, Inc., Chiyoda, Japan

Continuation of Ser. No. 304,964, Sep. 23, 1981, abandoned. This application Nov. 18, 1983, Ser. No. 552,871

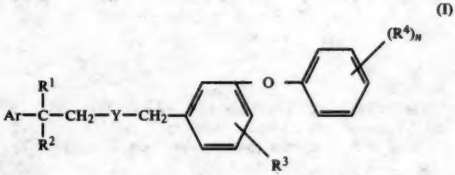
Claims priority, application Japan, Oct. 9, 1980, 55-140600

The portion of the term of this patent subsequent to Aug. 9, 2000, has been disclaimed.

Int. Cl.[4] A01N *43/30, 31/14;* **C07C** *43/267*

U.S. Cl. 514—721 **25 Claims**

1. 2-Arylethyl ether derivatives represented by the following general formula (I):



wherein:

Ar stands for an aryl group selected from the group consisting of phenyl and naphthyl groups, which are unsubstituted or substituted with the same or different substituents selected from the group consisting of

a halogen atom;

an unsubstituted or halogen substituted alkyl, alkoxy, alkylthio, alkenyl, alkynyl, alkenyloxy, alkynyloxy, alkoxyalkyl, alkoxyalkoxy, alkoxyalkylthio, acyl, alkoxycarbonyl, phenyl or phenoxy group;

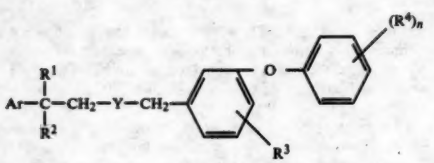
a cycloalkoxy, nitro, cyano, methylenedioxy, 3,4-difluoromethylenedioxy, 3,4-ethylenedioxy, 3,4-difluoroethylenedioxy or 3,4-trifluoroethylenedioxy group; and

a polymethylene group having 3 to 5 carbon atoms;

R_1 stands for a straight or branched chain alkyl group of 1 to 6 carbon atoms;
R_2 stands for a hydrogen atom, or a methyl or ethyl group;
R_3 stands for a halogen atom;
R_4 for a hydrogen or halogen atom, or an alkyl or alkoxy group having 1 to 4 carbon atoms;
n is an integer of 1 or 2 with the proviso that when n is 2, the group R_4 may be the same or different; and
Y stands for an oxygen atom.

10. An insecticidal and acaricidal agent comprising as an active ingredient at least one member selected from the group consisting of 2-arylethyl ether derivatives represented by the following general formula (I):

(I)



wherein:
Ar stands for an aryl group selected from the group consisting of phenyl and naphthyl groups, which are unsubstituted or substituted with the same or different substituents selected from the group consisting of -
a halogen atom;
an unsubstituted or halogen substituted alkyl, alkoxy, alkylthio, alkenyl, alkynyl, alkenyloxy, alkynyloxy, alkoxyalkyl, alkoxyalkoxy, alkoxyalkylthio, acyl, alkoxycarbonyl, phenyl or phenoxy group;
a cycloalkoxy, nitro, cyano, methylenedioxy, 3,4-difluoromethylenedioxy, 3,4-ethylenedioxy, 3,4-difluoroethylenedioxy or 3,4-trifluoroethylenedioxy group; and
a polymethylene group having 3 to 5 carbon atoms;
R^1 stands for a straight or branched chain alkyl group of 1 to 6 carbon atoms;
R^2 stands for a hydrogen atom, or a methyl or ethyl group;
R^3 stands for a halogen atom;
R^4 stands for a hydrogen or halogen atom, or an alkyl or alkoxy group having 1 to 4 carbon atoms;
n is an integer of 1 or 2 with the proviso that when n is 2, the group R^4 may be the same or different; and
Y stands for an oxygen atom.

4,599,363

METHOD FOR WETTING AND DISPERSING POWDERS

John J. Miles, Jr., Boonton, and Dominick F. DeMasi, Fort Lee, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 57,242, Jul. 13, 1979, abandoned, which is a continuation of Ser. No. 955,560, Oct. 27, 1978, which is a continuation of Ser. No. 675,440, Apr. 9, 1976. This application Jun. 1, 1981, Ser. No. 269,303

Int. Cl.[4] A61K *7/16*

U.S. Cl. 514—770 **7 Claims**

1. A method for rapidly dispersing and wetting solids in a liquid medium to form an essentially gas free mixture comprising:
(a) charging said liquid medium to a mixing tank;
(b) subjecting said medium to intimate turbulent mixing and continuous vacuum; and
(c) drawing said solids into said tank under the surface of said liquid medium by means of said vacuum into an area of highly turbulent mixing whereby simultaneously degassing, wetting and dispersing said solids.

4,599,364

CHEMICAL MODIFICATION OF MEMBRANE TO MODIFY TRANSPORT PROPERTIES

Michel S. Lefebvre, Sydney, Australia, assignor to Limit Instant Limited, England

PCT No. PCT/AU84/00059, § 371 Date Dec. 17, 1984, § 102(e) Date Dec. 17, 1984, PCT Pub. No. WO84/04256, PCT Pub. Date Nov. 8, 1984

PCT Filed Apr. 11, 1984, Ser. No. 690,501

Claims priority, application United Kingdom, Apr. 20, 1983, 8310666

Int. Cl.[4] C08D *5/20;* **C08J** *9/36*

U.S. Cl. 521—53 **7 Claims**

1. A method for the modification of the transport properties of a polyamide ultrafiltration membrane comprising the steps of: treating the membrane with a flux consisting essentially of a polar solvent selected from the group consisting of water, liquid ammonia, and mixtures thereof at a temperature below the glass transition temperature of the membrane polymer; progressively lowering the pH of the polar solvent to break hydrogen bonds within the polymer structure and produce an activated polymer having active groups thereon; and reacting the activated polymer with a sulfonic acid derivative dye stuff reagent which is reactive therewith.

4,599,365

FOAMING AND CURING POLYIMIDE RESINS BY APPLICATION OF MICROWAVE ENERGY

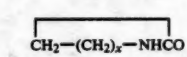
John Gagliani, 6280 Lance Pl., San Diego, Calif. 92120, and John V. Long, 1756 E. Lexington Pl., El Cajon, Calif. 92021

Continuation-in-part of Ser. No. 565,574, Dec. 27, 1983. This application Nov. 19, 1985, Ser. No. 799,614

Int. Cl.[4] C08J *9/22, 9/24*

U.S. Cl. 521—56 **20 Claims**

1. The method of making a resilient, flame resistant modified polyimide foam which comprises the steps of:
reacting an aromatic dianhydride with an oximine having the general formula:



wherein "X" is an integer from 2 to 4, in a mole ratio of oxoimine to dianhydride between about 1.5:1 and about 0.05:1 to produce an N-substituted aliphatic imide;
dissolving said imide in a reactive solvent esterifying agent to esterify said imide;
adding thereto a diamine;
drying the resulting solution; and
exposing the dried material to microwave energy at a level of from about 5 to 80 KW for from 5 to 60 minutes to cause said material to spontaneously foam and cure,
whereby a resilient foam having good flame resistance is produced.

4,599,366

ANTI-STATIC STYRENE POLYMER PARTICLES

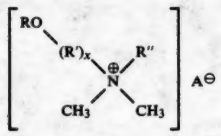
Haven S. Kesling, Jr., Drexel Hill, and James J. Harris, West Chester, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 23, 1985, Ser. No. 812,090

Int. Cl.[4] C08J *9/22*

U.S. Cl. 521—57 **8 Claims**

1. Method of making expandable styrene polymer particles which exhibit anti-lumping and anti-static properties comprising coating the surface of expandable styrene polymer paraticles with 0.1 to 0.4 weight percent bases on polymer of a quaternary ammonium salt having general formula



Wherein R may be C_1–C_{11} linear or branched alkyl and mixtures thereof, R′ may be oxyethylene, oxypropylene, oxybutylene or mixtures thereof, R″ may be C_1–C_4 linear or branched alkyl, hydroxylalkyl, or benzyl, x may be a integer from 6 to 20, and A may be any anion.

4,599,367

WATER-BLOWN SILICONE FOAM

Therese M. Bauman, Midland, and John E. Dietlein, Bay City, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 16, 1985, Ser. No. 787,854
Int. Cl.⁴ C08J *9/14, 9/30*
U.S. Cl. 521—71 **13 Claims**

1. A method of producing an open-cell silicone foam at room temperature consisting of

(A) mixing ingredients consisting essentially of

(1) 100 parts by weight of a polydiorganosiloxane having organic groups selected from the group consisting of methyl, ethyl, propyl, vinyl, phenyl, and 3,3,3-trifluoropropyl, endblocking consisting of hydroxyl or vinyl groups, and a viscosity of from 0.4 to 100 Pa·s at 25° C.,

(2) from 15 to 50 parts by weight of a silicon hydride of the formula

where R is an alkyl radical of 1 to 4 carbon atoms or phenyl and R^1 is R or hydrogen, x and y are such that x is from 0 to 40 percent of y, y is at least 3, and x plus y are such that the viscosity of the silicon hydride is below 0.05 Pa·s at 25° C.,

(3) from 0.5 to 15 parts by weight of water,

(4)from 10 to 100 parts by weight of platinum per million parts of (A) in the form of a platinum catalyst,

(5) optionally a profoamer consisting essentially of a resinous, benzene-soluble organosiloxane copolymer consisting essentially of $SiO_{4/2}$ units, silicon-bonded hydroxyl groups, $(CH_3)_3SiO_{1/2}$ units and fluorine-containing units selected from the group consisting of $R_aR_b'SiO_{(4-a-b)/2}$ and $R''[Si(R')_bO_{(3-b)/2}]_2$ and mixtures thereof, where R is a monovalent organic radical containing at least four perfluorinated carbon atoms and is bonded to the silicon atom of said fluorine-containing units by a sequence of at least two methylene units or by an oxygen atom that is, in turn, bonded to a sequence of at least two methylene units, R′ is an alkyl radical containing from 1 to 3 carbon atoms, and R″ is a divalent organic radical containing at least four perfluorinated carbon atoms and is bonded to the silicon atom of said fluorinecontaining units by means of a carbon or oxygen atom, a is 1 or 2, b is 0, 1 or 2 and the sum of a and b is 3 or less with the provision that when R and R″ represent fluorine-containing units bonded to silicon via an oxygen atom the organosiloxane copolymer optionally contains repeating units of the formula $GSiO_{3/2}$ where G represents the residue obtained by removal of the hydrogen atom from a hydroxyl group of a linear organic polymer containing an average of at least one terminal hydroxyl group per molecule and selected from the group consisting of polyethers, polyoxyalkylene glycols, homopolymers of ethylenically unsaturated alcohols and copolymers of ethylenically unsaturated alcohols with ethylenically unsaturated hydrocarbons; the molar ratio of all units other than hydroxyl and $SiO_{4/2}$ units to $SiO_{4/2}$ units is from 0.7:1 to 1.1:1, inclusive, and the concentration of said fluorinecontaining units and any $GSiO_{3/2}$ units is sufficient to

(a) impart a surface tension of less than 2.2×10^{-4} newtons per centimeter at 25° C. to a 10 percent by weight solution of (5) in a hydroxyl endblocked polydimethylsiloxane exhibiting a viscosity of 0.08 Pa.s at 25° C., and

(b) require the addition of from 0 to 100 percent by weight of xylene to said 10 percent by weight solution to achieve optical clarity, and

(6) optionally an alcohol having from 1 to 12 carbon atoms, and

(B) allowing the mixture to form a froth and cure at ambient temperature to an elastomeric silicone foam.

4,599,368

MARINE ANTI-FOULING COATING FORMULATIONS CONTAINING A SOLUBLE PHASE INCLUDING A ORGANOTIN POLYMER IN COMBINATION WITH AN INSOLUBLE PHASE INCLUDING A CROSSLINKED ORGANOTIN POLYMER

Albert L. Kimmel, Kansas City, Mo.; Cecil C. Chappelow, Jr., Leawood, Kans., and Vincent J. Castelli, Severna Park, Md., assignors to Midwest Research Institute, Kansas City, Mo.

Filed Oct. 31, 1984, Ser. No. 666,727
Int. Cl.⁴ C08K *5/57*; C08L *33/02*
U.S. Cl. 523—122 **24 Claims**

1. A coating composition that can be applied to marine surfaces to form a durable, tough, flexible film and can release an effective amount of a marine biocide, which comprises:

(a) an effective amount of a coating composition solvent;

(b) a portion soluble in the solvent comprising an effective biocidal amount of a film-forming organotin acrylic polymer composition and an effective film-forming amount of a metal-free acrylic polymer composition and;

(c) portion insoluble in the solvent comprising an effective biocidal amount of a crosslinked organotin acrylic polymer composition having sufficiently small suspendable particle size and an effective biocide releasing amount of an inorganic filler.

4,599,369

INTUMESCENT COMPOSITION

Tessa Malcolm-Brown, Cambridge, England, assignor to Dixon International Limited, Cambridge, England

Filed Oct. 9, 1984, Ser. No. 659,630
Int. Cl.⁴ C09C *5/26, 5/18*; C08L *21/00*
U.S. Cl. 523—179 **10 Claims**

1. An intumescent rubber composition comprising a rubber containing:

(a) one or more organic polyhydroxy compounds as a carbonific in an amount of 0.41 to 1.23 by weight of the total composition;

(b) dicyandiamide for guanidine as a spumific in an amount of 1.04 to 3.10% by weight of the total composition;

(c) an ammonium phosphate as an activator for the carbonific in an amount of 2.18 to 6.54% by weight of the total composition; and

(d) a melamine formaldehyde resin as a binder in an amount of 1.97 to 5.9% by weight of the total composition;

said components (a), (b), (c) and (d) being intermixed with each other and then added to the rubber in an amount of 2 to 50% by weight of the total composition.

4,599,370
POWDERED ELASTOMER DRY BLENDS AND PROCESS FOR INJECTION MOLDING

Richard F. Grossman, Shelton, and Francis W. McKane, Jr., Bridgeport, both of Conn., assignors to Plastic Specialties and Technologies, Inc., Cleveland, Ohio

Filed Dec. 6, 1984, Ser. No. 678,703
Int. Cl.[4] C08K *3/04, 3/34, 9/12, 9/04*
U.S. Cl. 523—200 **21 Claims**

1. A powdered elastomer composition for forming vulcanized products by heat-compression or injection molding comprising a homogeneous blend of

a powdered vulcanizable elastomer, a cross-linking agent for said elastomer and

a powdered uniform predispersion of a particulate filler and an additive sorbed in said filler, said additive normally tending to swell or agglomerate said powdered elastomer when mixed therewith, said blend of elastomer, cross-linking agent and predispersion being mixed at ambient temperature to provide a free-flowing mixture without swelling or agglomeration of said powdered elastomer.

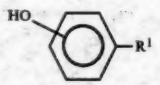
4,599,371
PREPARATION OF SELF-CROSSLINKING SYNTHETIC RESINS

Werner Loch, Erpolzheim; Eberhard Schupp, Schwetzingen; Rolf Osterloh, Gruenstadt; Arnold Dobbelstein, Junkersdorf, and Klaas Ahlers, Muenster, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

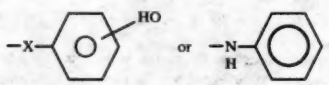
Filed Aug. 17, 1984, Ser. No. 641,859
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1983, 3329693
Int. Cl.[4] C08K *3/20*
U.S. Cl. 523—402 **6 Claims**

1. A process for the preparation of a synthetic resin which is self-crosslinking under the action of heat and based on polyadducts having a mean molecular weight $\overline{M}_n$ of from 750 to 5,000, contains on average two or more phenolic OH groups per molecule and can be diluted with water when an acid is added, wherein one or more aliphatic or aromatic epoxy resins possessing on average two or more epoxide groups per molecule and having an epoxide equivalent weight of from 87 to 2,000 are reacted with

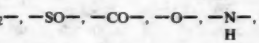
(a) from 55 to 125 mol%, based on the epoxide groups present in the epoxy resin, of a compound which, in addition to one or more phenolic OH groups, contains a further functional group whose reactivity toward epoxide groups is the same as, or greater than, that of a phenolic OH group, and which is of the formula (I)


(I)

where the OH group is meta or para to R^1, and R^1 is a radical



where the OH group is meta or para to X, and X is a straight-chain or branched divalent aliphatic radical of 1 to 3 carbon atoms or



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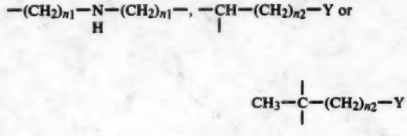
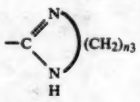


where n_1 is 1, 2 or 3, n_2 is 0, 1, 2 or 3 and Y is carboxyl, mercapto, a basic secondary amino group containing 1 to 4 carbon atoms, or an N-alkyl-substituted acid amide group where the alkyl chain is of 3 to 6 carbon atoms, is interrupted by a secondary basic amino group and is unsubstituted or substituted by an OH group, or Y is a cyclic amidine of the formula (II)


(II)

where n_3 is 2 or 3, until the epoxide value is <0.008, and the resulting polyadduct is reacted with, per mole of phenolic OH groups,

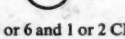
(b_1) from 0.8 to 2.5 moles of formaldehyde or of a formaldehyde-donating compound and

(b_2) from 0.7 to 2 moles of a mixture of

$b_{2.1}$ from 0 to 99 mol% of a secondary amine of the formula (III)

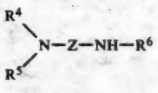
(III)

where R^2 and R^3 are identical or different and are each a cycloaliphatic radical of 5 or 6 carbon atoms or a straight-chain or branched aliphatic radical of 1 to 8 carbon atoms which cycloaliphatic, straight-chain or branched aliphatic radical may contain 1 or 2 alkoxy groups of 1 to 6 carbon atoms, or of a cyclic secondary amine of the formula (IV)

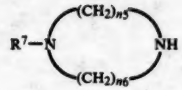

(IV)

where n_4=4, 5 or 6 and 1 or 2 CH_2 groups can be replaced by an oxygen or sulfur atom, or of an alkylethanolamine or alkylisopropanolamine, where alkyl is of 1 to 6 carbon atoms, or of a dialkanolamine where alkyl is of 2 or 3 carbon atoms, or of a mixture of such secondary amines with

$b_{2.2}$ from 1 to 100 mol% of a secondary amine of the formula (V)


(V)

where R^4, R^5 and R^6 are identical or different and are each a cycloaliphatic radical of 5 or 6 carbon atoms or a straight-chain or branched aliphatic radical of 1 to 8 carbon atoms which may contain 1 or 2 hydroxyl groups or alkoxy groups of 1 to 6 carbon atoms, and Z is a straight-chain or branched divalent aliphatic radical of 2 to 12 carbon atoms, or of a second ry amine of the formula (VI)



(VI)

where n_5 and n_6 are identical or different and are each 1, 2 or 3, and R^7 is an OH-substituted straight-chain or branched alkyl radical of 2 to 6 carbon atoms, and is thus converted to a polymeric Mannich base.

4,599,372

SELF-INVERTING WATER-IN-OIL POLYMER EMULSIONS HAVING LOW POUR POINT TEMPERATURES

Dinshaw F. Bardoliwalla, Randolph, and Reuben H. Grinstein, Denville, both of N.J., assignors to Diamond Shamrock Chemicals Company, Dallas, Tex.

Filed Jul. 25, 1983, Ser. No. 516,535
Int. Cl.[4] C08L *33/02, 33/26*
U.S. Cl. 523—336 **11 Claims**

1. In a self-inverting polymer water-in-oil emulsion, the improvement comprising addition of effective amounts of (a) pour point depressant, (b) diol and (c) triol to depress pour point of the emulsion, to provide fluidity at about −15° C. and to inhibit skin formation on surface of the emulsion at low temperatures of from about −5° to about −50° C.

4,599,373

AROMATIC OLIGOMERS AND RESINS

Michael E. B. Jones, Chester, England, assignor to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 558,525, Dec. 6, 1983, Pat. No. 4,530,992.
This application Apr. 19, 1985, Ser. No. 725,347
Claims priority, application United Kingdom, Dec. 6, 1982, 8234715; May 27, 1983, 8314707
Int. Cl.[4] A61K *6/08, 5/04*
U.S. Cl. 523—116 **16 Claims**

1. A dental filling material which comprises

(a) an oligomer, which may be linear or branched, which

(i) comprises the repeating unit

$$-Ar^1\text{-}CHR-$$

wherein Ar^1 is an aromatic group, or a substituted derivative thereof, each of which aromatic groups may be the same or different and R, each of which may be the same or different, is hydrogen or a hydrocarbyl group;

(iii) has pendant and/or terminal groups, which may be the same or different; which are acyloxymethyl groups in which the acyl portion is derived from polymerizable olefinically unsaturated carboxylic acid; and

(iii) has an average functionality between 0.5 and 10; and

(b) a particulate filler.

4,599,374

SOLVENT RESISTANT VULCANIZABLE SILICONE RUBBER COMPOSITIONS MADE WITH FLUOROSILICONE HYDRIDE CROSS LINKING AGENTS

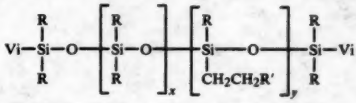
Ben A. Bluestein, Schenectady, N.Y., assignor to General Electric Co., Waterford, N.Y.

Filed Sep. 2, 1982, Ser. No. 416,415
Int. Cl.[4] C08L *83/00*
U.S. Cl. 523—213 **38 Claims**

1. A solvent resistant vulcanizable silicone rubber composition comprising:

(A) 100 parts of a mixture comprised of:

(i) 100 parts of a vinyl-containing polymer of the formula,



where Vi is vinyl, R is selected from the group consisting of alkyl radicals of 1 to about 8 carbon atoms and phenyl, R′ is perfluoroalkyl of 1 to about 8 carbon atoms, x is at least 1, and y is at least 10, and the viscosity of the compound is at least 300 centipoise at 25° C., and the concentration of siloxy units taken y times varies from about 5 to about 98 mole percent;

(ii) from about 10 to about 60 parts of a resin having SiO_2 units; a siloxane having a perfluorinated alkyl selected from the group consisting of R″ $SiO_{1.5}$ units, RR″SiO units, $R_2R''SiO_{0.5}$ units and mixtures thereof; and vinyl-containing siloxane units selected from the group consisting of $ViRR''SiO_{0.5}$, $ViR_2SiO_{0.5}$, ViR″SiO, ViRSiO and mixtures thereof; where the hydrocarbon substituent to Si ratio varies from about 0.8 to about 2.4; Vi is vinyl; R is selected from the group consisting of alkyl radicals of 1 to about 8 carbon atoms and phenyl; R″ is a $(-CH_2-)_aR'$ radical where R′ is perfluoroalkyl of 1 to about 8 carbon atoms, a is at least 2 but less than 10 and $(-CH_2-)_a$ is straight or branched chain;

(iii) a suitable amount of catalyst capable of promoting the cure of the mixture; and

(B) from about 1 to about 50 parts, based on 100 parts of the mixture (A), of a crosslinking polymer having about 0.75 to about 3.0 moles of $R_2HSiO_{0.5}$, about 0.37 to about 1.5 moles of $R''SiO_{1.5}$, and about 0.5 to about 1.5 moles of SiO_2, wherein R is selected from the group consisting of alkyl radicals of 1 to about 8 carbon atoms and phenyl; and R″ is a $(-CH_2-)_aR'$ radical where R′ is perfluoroalkyl of 1 to about 8 carbon atoms, a is at least 2 but less than 10, and $(-CH_2-)_a$ is straight or branched chain.

4,599,375

FLAMEPROOF POLYMERIC COMPOSITIONS CONTAINING ACID PIPERAZINE PYROPHOSPHATE

Ferruccio Berte'; Franco Marciandi, and Marco Binaghi, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed May 16, 1984, Ser. No. 610,822
Claims priority, application Italy, May 18, 1983, 21149 A/83
Int. Cl.[4] C08K *3/10, 3/36, 5/53, 5/34*
U.S. Cl. 524—100 **7 Claims**

1. Polymeric compositions, endowed with high self-extinguishing properties when exposed to flame, comprising (1) at least one polymer selected from the group consisting of polyethylene prevailing isotactic polypropylene, polystyrene, copolymers of acrylonitrile and styrene and copolymers of acrylonitrile, styrene and butadiene and (2) for 100 parts by weight of the composition:

(a) 20 to 50 parts of acid piperazine pyrophosphate;

(b) 0 to 3 parts of at least one compound selected from the group consisting of TiO_2, SiO_2 and silicic acid, in powder having particles size lower than or equal to 0.1 micron;

(c) 0 to 35 parts of at least one compound selected from the group consisting of melamine phosphates and pyrophosphates, melamine, ammonium polyphosphate, polycarboxy-piperazine and condensates of ethylene- urea and formaldehyde, as a substitute for an equal weight of acid piperazine pyrophosphate, and in such amount that the composition contains at least 5 parts of acid piperazine pyrophosphate for 100 parts of composition.

4,599,376

POLYVINYL CHLORIDE COMPOSITION

Masahiro Takimoto; Satoshi Ota, and Yoshio Yamazaki, all of Aichi, Japan, assignors to Toyoda Gosei Kabushiki Kaisha, Nishikasugai, Japan

Filed Mar. 25, 1985, Ser. No. 715,944
Claims priority, application Japan, Mar. 28, 1984, 59-58504
Int. Cl.[4] C08K 3/08
U.S. Cl. 524—441 4 Claims

1. A weather-resistant resinous molded article having a metallic luster appearance molded from a polyvinyl chloride composition comprising polyvinyl chloride having dispersed therein platelet aluminum powder, in which the aluminum powder has a diameter of at least 10μ and is present in an amount of 0.2–10 parts by weight per 100 parts by weight of the polyvinyl chloride.

4,599,377

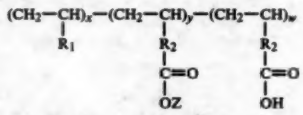
ACID BASE INTERACTING POLYMER SOLUTIONS

Ilan Duvdevani, Leonia; Donald N. Schulz, Annandale, both of N.J.; Kissho Kitano, Ohi, Japan, and Dennis G. Peiffer, E. Brunswick, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 625,975, Jun. 29, 1984, abandoned, which is a continuation-in-part of Ser. No. 566,349, Dec. 28, 1983, abandoned. This application Jul. 19, 1985, Ser. No. 756,834
Int. Cl.[4] C08L 39/00
U.S. Cl. 524—516 15 Claims

1. A process for forming a shear thickening or a organic liquid having a viscosity of at least about 10 CPS which includes the steps of:

(a) forming a first solution of an organic hydrocarbon liquid and a copolymer of an alpha-olefin and a vinyl alkylenecarboxylic acid having an acid content of from about 0.01 to 10 mole percent, wherein said copolymer of said alpha-olefin and said vinyl alkylenecarboxylic acid has the formula:



wherein Z is R_3, R_1 is an alkyl group having about 1 to about 25 carbon atoms, R_2 is an alkylene group having about 3 to about 17 carbon atoms, R_3 is an alkyl group having about 1 to about 25 carbon atoms, x is about 99.99 to about 95.0 mole %, more preferably about 99.95 to about 97.0 and most preferably about 99.90 to about 98.0 and y plus w is about 0.01 to about 5.0 mole %, wherein said polymer must contain both acid and ester species;

(b) forming a second solution of an organic hydrocarbon liquid and an amine containing polymer which contains basic nitrogen atoms wherein the basic nitrogen content ranges from about 4 to about 500 milliequivalents per 100 gms. of polymer, said amine containing polymer being a copolymer formed from a first monomer and a second monomer, said first monomer being selected from the group consisting of styrene, t-butyl styrene, alkylacrylates, alkylmethacrylates, vinyl chloride, isoprene, butadiene, acrylonitrile and butadiene/styrene and said second monomer being selected from the group consisting of pyridine, anilines and pyrroles; and

(c) mixing said first and said second solutions to form an organic hydrocarbon liquid having an interpolymer complex of said neutralized copolymer of an alph-olefin and a vinyl alkylenecarboxylic acid and said amine containing polymer therein, wherein said complex is present at a level of from 0.01% to about 10% and the viscosity of said solution increases by at least 10% as shear rate increases.

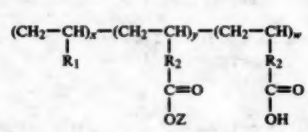
15. A solution which comprises:

(a) an organic liquid; and

(b) about 0.01 to about 10 weight percent of an interpolymer complex of:

(1) a copolymer of styrene/vinyl pyridine; and

(2) a copolymer of an alpha-olefin and a vinyl alkylene carboxylic acid having the formula:



wherein Z is R, R_1 is an alkyl group having about 1 to about 25 carbon atoms, R_2 is an alkylene group having about 3 to about 17 carbon atoms, R is an alkyl group having about 1 to about 25 carbon atoms, x is about 99.99 to about 95.0 mole %, wherein y plus w is about 0.01 to about 5.0 mole percent, wherein said polymer must contain both acid and ester species.

4,599,378

VINYL ACETATE COPOLYMER EMULSIONS FOR PAPER COATING COMPOSITIONS

Mary L. Hausman, Barto; Gerald D. Miller, Macungie, and Lawrence K. Wempe, Center Valley, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 22, 1984, Ser. No. 623,644
Int. Cl.[4] C08J 27/00
U.S. Cl. 524—554 20 Claims

1. A copolymer emulsion comprising a vinyl ester copolymer colloidally dispersed in an aqueous medium, the copolymer consisting of

(a) vinyl acetate,

(b) 0.1 to 10 wt % of an ethylenically unsaturated C_3–C_{10} mono- or dicarboxylic acid or half ester of such dicarboxylic acid with a C_1–C_{18} alkanol,

(c) about 0.25 to 3 wt % of dicyclopentadienyl acrylate or dicyclopentadienyl methacrylate, and

(d) 0–50 wt % of a C_1–C_8 alkyl acrylate or methacrylate.

4,599,379

PROCESS FOR THE PRODUCTION OF POLYMERS AND AQUEOUS SOLUTIONS THEREOF

Peter Flesher; David Farrar, and Alan C. Benson, all of West Yorkshire, England, assignors to Allied Colloids Ltd., England

Filed Jan. 16, 1985, Ser. No. 692,277
Claims priority, application United Kingdom, Jan. 17, 1984, 8401206
Int. Cl.[4] C08J 3/02
U.S. Cl. 524—801 10 Claims

1. A process in which a stable, water dispersable, substantially anhydrous dispersion of water soluble or water swellable polymer particles in water-immiscible liquid is made by polymerising aqueous polymerisable monomer dispersed in water-immiscible liquid by reverse phase suspension polymerisation to form a dispersion of aqueous polymer dispersed in water-immiscible liquid, dehydrating this dispersion and, before or after the dehydration, adding an oil soluble surfactant that has a solubility at 20 degrees C. in the water-immiscible liquid of at least 1 part per 9 parts by weight of the liquid, that has a solubility at 20 degrees C in water of less than 1 part per 100 parts by weight water, that has HLB at least 7 and that will promote distribution of the dehydrated dispersion into water.

4,599,380

POLYPHENYLENE ETHER RESIN COMPOSITION

Sumio Ueda, Yokohama, and Kunio Fukuda, Chigasaki, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 471,845, Mar. 3, 1983, abandoned. This application Aug. 27, 1984, Ser. No. 644,595
Claims priority, application Japan, Mar. 9, 1982, 57-35836
Int. Cl.[4] C08L 61/04
U.S. Cl. 525—68 22 Claims

1. A polyphenylene ether resin composition comprising:
(A) 10 to 80% by weight of a polyphenylene ether resin, and
(B) 90 to 20% by weight of a rubber modified resin, said rubber modified resin containing a discontinuous elastomeric rubber phase dispersed in a continuous resin phase comprising a copolymer of a vinyl cyanide compound and a vinyl aromatic compound or a mixture of a homopolymer of a vinyl aromatic compound and a copolymer of a vinyl cyanide compound and a vinyl aromatic compound, said elastomeric rubber phase comprising a grafted elastomeric rubber which has a graft phase of a vinyl cyanide compound copolymerized with a vinyl aromatic compound, said elastomeric rubber phase having a grafting degree of 35 to 300% by weight, said grafting degree being defined by the formula:

$$G = \frac{A - R}{R} \times 100$$

wherein G represents the grafting degree, % by weight; R the amount of rubber contained in one gram of the rubber modified resin, gram; and A the amount of the elastomeric rubber phase contained in one gram of the rubber modified resin, gram, said graft phase containing 12 to 30% by weight of the vinyl cyanide compound based on the total amount of the vinyl cyanide compound and the vinyl aromatic compound present in the graft phase, said continuous resin phase containing 3 to 10% by weight of the vinyl cyanide compound based on the amount of the continuous resin phase.

4,599,381

SILICONE-MODIFIED PVC

Wan-Li Liu, Ballston Lake, N.Y., assignor to General Electric Company, Silicone Products Division, Waterford, N.Y.

Filed Feb. 21, 1985, Ser. No. 703,637
Int. Cl.[4] C08G 77/42
U.S. Cl. 525—104 12 Claims

1. A method for grafting a polydiorganosiloxane to a poly(vinyl chloride) polymer, comprising reacting a cyclic polydiorganosiloxane with poly(vinyl chloride) polymer under anhydrous conditions in the presence of a cationic initiator.

4,599,382

RUBBER COMPOSITION COMPRISING A THERMOSETTING RESIN AND A FUNCTIONAL RUBBER-LIKE COPOLYMER

Hozumi Sato; Shin-ichiro Iwanaga, both of Yokkaichi; Hiroji Enyo, Suzuka; Yasuhiko Takemura, and Yoshiaki Kawamura, both of Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1985, Ser. No. 714,032
Claims priority, application Japan, Mar. 21, 1984, 59-52235; Mar. 21, 1984, 59-52236
Int. Cl.[4] C08L 61/10
U.S. Cl. 525—139 8 Claims

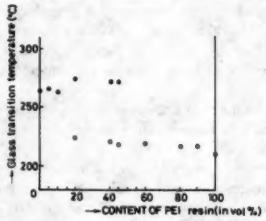
1. A rubber composition consisting essentially of 5–99 parts by weight of a thermosetting resin and 95–1 parts by weight of one of the following functional rubber-like copolymers (I), (II) and (III) having a Mooney viscosity ML_{1+4}^{100} of 20–120:
(I) a functional rubber-like copolymer consisting of 1–20% by weight of a monomer having epoxy groups, hydroxyl groups or amino groups, 15–50% by weight of acrylonitrile and 40–80% by weight of butadiene, isoprene, or both of them, as the monomer units constituting the polymer or,
(II) a functional rubber-like copolymer consisting of 1–20% by weight of a monomer having epoxy groups, hydroxyl groups or amino groups, 40–99% by weight of an alkyl(meth)acrylate, an alkoxyalkyl(meth)acrylate or both thereof and 0–30% by weight of monomers copolymerizable with said monomers other than butadiene and isoprene, as the monomer units constituting the polymer or
(III) a functional rubber-like copolymer consisting of 1–20% by weight of a monomer having epoxy groups, hydroxyl groups or amino groups, 15–50% by weight of acrylonitrile, 20–60% by weight of butadiene, isoprene or both thereof and 5–65% by weight of an alkyl(meth)acrylate, an alkoxyalkyl(meth)acrylate, or both thereof, as the monomer units constituting the polymer.

4,599,383

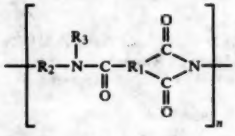
POLYAMIDEIMIDE RESIN COMPOSITION

Fuminori Satoji, Kuwana, Japan, assignor to NTN-Rulon Industries Co., Ltd., Tokyo, Japan

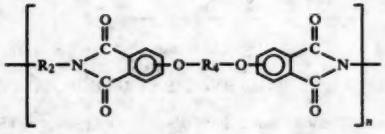
Filed Nov. 2, 1984, Ser. No. 667,671
Claims priority, application Japan, Apr. 28, 1984, 59-86704
Int. Cl.[4] C08F 8/30; C08L 77/00
U.S. Cl. 525—180 4 Claims



1. A polyamideimide resin composition comprising:
a polyamideimide resin represented by the formula:



(wherein R_1 is a trivalent aromatic radical having at least one benzene ring; R_2 is a divalent organic radical; and R_3 is hydrogen, a methyl radical or a phenyl radical)
a polyetherimide resin represented by the formula:



(wherein R_2 is a divalent organic radical and R_4 is a divalent organic radical having at least one benzene ring), and
a fluororesin having a crystalline melting point of 250° C. or higher and a specific melt viscosity of $1\times10^3-10^6$ poise at 372±1° C., the content of said fluororesin being 10–30% by volume in the entire composition, and the ratio by

volume of said polyamideimide resin to said polyetherimide resin being 55:45 to 95:5.

4,599,384

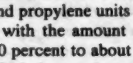
NOVEL EPDM-ISOBUTYLENE GRAFT COPOLYMERS

Michael F. Farona, Cuyahoga Falls, and Joseph P. Kennedy, Akron, both of Ohio, assignors to The University of Akron, Akron, Ohio

Filed Jul. 23, 1984, Ser. No. 633,300
Int. Cl.[4] C08F *255/10*
U.S. Cl. 525—245 **15 Claims**

1. An EPDM graft terpolymer, comprising:

the terpolymer having ethylene and propylene units randomly distributed in the backbone thereof, the total number of said ethylene and propylene units being from about 100 to about 10,000, with the amount of ethylene units ranging from about 10 percent to about 90 percent based on the total number of ethylene and propylene units, from about 1 to 100



where R is a terpolymerizable head group selected from the group of dicyclopentadiene and ethylidenenorbornene, said R is attached to a polymer P polyisobutylene, wherein said graft copolymer has a molecular weight of from about 5,000 to about 1,000,000 as calculated by GPC method.

5. A process for making a graft terpolymer comprising the steps of:

reacting monomers of ethylene and propylene with a macromonomer in the presence of a Ziegler-Natta catalyst combination,

said ethylene and propylene monomers forming the backbone of the terpolymer and said macromonomer is a polymer attached to dicyclopentadiene or ethylidenenorborene, said dicyclopentadiene or ethylidenenorborene forming a portion of said backbone of said terpolymer and said polymer forming a pendant branch from said backbone.

4,599,385

MALEIC MODIFIED BUTENE COPOLYMERS

Anthony B. Clayton, and Brian D. Kramer, both of New Castle County, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Oct. 10, 1984, Ser. No. 659,585
Int. Cl.[4] C08F *255/02, 255/10*
U.S. Cl. 525—285 **1 Claim**

1. A modified crystalline copolymer comprising about 1 to 25% by weight of butene-1 and about 99 to 75% by weight of propylene, said copolymer having about 0.5 to 5% by weight of maleic acid or maleic anhydride, based on the weight of said copolymer, grafted thereto, and having an intrinsic viscosity of about 0.55 to about 1.02.

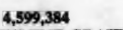
4,599,386

HEAT STABLE TETRAFLUOROETHYLENE-PERFLUORO(ALKYL VINYL ETHER) COPOLYMERS

Dana P. Carlson, Chadds Ford, Pa.; Dewey L. Kerbow, Vienna, W. Va.; Thomas J. Leck, Orange, Tex., and Allan H. Olson, Parkersburg, W. Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 18, 1984, Ser. No. 662,064
Int. Cl.[4] C08F *15/02*
U.S. Cl. 525—326.2 **3 Claims**

1. A heat-stable melt-processible copolymer of tetrafluoroethylene and at least one perfluoro(alkyl vinyl ether) of the formula



where R_f is of 1–8 carbon atoms, said copolymer having at least about 8 —$CONH_2$ end groups per 10^6 carbon atoms present in the copolymer chain and having at least 15 —CH_2OH end groups per 10_6 carbon atoms, said —$CONH_2$ end groups also being present in an amount substantially equal to or greater than the amount of any —COF and —COOH end groups present.

4,599,387

TETRAALKYL TITANATE MODIFIED NYLON MAGNET WIRE INSULATION COATING

Francois A. Lavallee, Fort Wayne, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

Division of Ser. No. 620,310, Jun. 13, 1984. This application May 10, 1985, Ser. No. 732,534
Int. Cl.[4] C08L *77/00*
U.S. Cl. 525—419 **2 Claims**

1. A magnet wire enamel composition comprising nylon reacted with tetraalkyl titanate in an amount of about 0.5% to 3.5% by weight of the nylon present in the enamel composition.

4,599,388

PROCESS FOR MODIFYING POLYBENZIMIDAZOLE POLYMERS WITH ETHYLENE CARBONATES

Esther A. Bower, Flemington, and Joseph J. Rafalko, Chatham Township, Morris County, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Jan. 16, 1985, Ser. No. 691,962
Int. Cl.[4] C08G *69/26, 69/28, 73/18;* C08L *69/00*
U.S. Cl. 525—433 **11 Claims**

1. A process for modifying a polybenzimidazole polymer which comprises reacting ethylene carbonate with a polybenzimidazole polymer in an organic solvent medium to produce a hydroxyethylated polybenzimidazole product.

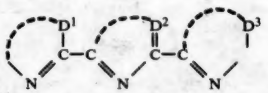
4,599,389

POLYMERIC MORDANT CONTAINING NITROGEN-COORDINATING LIGAND FOR METALLIZABLE DYES

James A. Reczek, Rochester; Ignazio S. Ponticello, Pittsford, and Philip S. Bryan, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

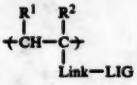
Division of Ser. No. 688,205, Jan. 2, 1985. This application Oct. 24, 1985, Ser. No. 791,018
Int. Cl.[4] C08F *26/06, 26/08, 126/06, 26/12*
U.S. Cl. 526—265 **9 Claims**

1. A polymer comprising a polymeric backbone having appended thereto nitrogen-coordinating ligands having the formula:



wherein D^1, D^2, and D^3 each independently represents the atoms necessary to complete an aromatic heterocyclic nucleus having at least one ring of 5 to 7 atoms.

2. The polymer of claim 1 which comprises recurring units having the formula:

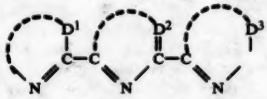


wherein:

R^1 and R^2 each independently represents hydrogen or an alkyl or substituted alkyl group having from 1 to about 6 carbon atoms;

Link represents a bivalent linking group; and

LIG represents a nitrogen-coordinating ligand having the formula:



wherein D^1, D^2, and D^3 each independently represents the atoms necessary to complete an aromatic heterocyclic nucleus having at least one ring of 5 to 7 atoms.

3. The polymer of claim 2 which is a metal complex.

6. The polymer of claim 3 wherein D^1, D^2 and D^3 each independently represent the atoms necessary to complete a pyridine or substituted pyridine ring.

4,599,390

HIGH MOLECULAR WEIGHT WATER-SOLUBLE POLYMERS AND FLOCCULATION METHOD USING SAME

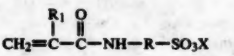
You-Ling Fan, East Brunswick; George L. Brode, Somerville, both of N.J., and Meyer R. Rosen, Spring Valley, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 474,602, Mar. 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 302,110, Sep. 14, 1981, abandoned. This application Sep. 18, 1985, Ser. No. 777,458

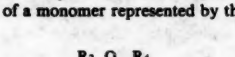
Int. Cl.[4] C08F *30/04*

U.S. Cl. 526—240 **21 Claims**

1. A water-soluble polymer having a high molecular weight of greater than 500,000 resulting from the polymerization of a water-in-oil monomer emulsion containing about 0.1–20 mole % of a hydrophobic vinyl monomer having a water-solubility of less than about 5 weight % in the oil phase; about 1–40 mole % of a monomer represented by the formula:



wherein R_1 represents a hydrogen atom or a methyl group, R_2 represents a divalent hydrocarbon group having from 2 to 13 carbon atoms and X represents a monovalent cation; about 20–98.9 mole % of a monomer represented by the formula:



wherein R_3 represents ahydrogen atom or a methyl group, and R_4 and R_5 are each a hydrogen atom, a methyl group or an ethyl group; and from 0 up to about 40 mole % of an ethylenically-unsaturated carboxylic acid or its salt; based on the total moles of monomer in said emulsion.

4,599,391

COATING COMPOSITION FOR POWER CABLE

Kaoru Yamamoto, Tokyo; Takashi Inoue; Shinji Kojima, both of Yokohama, and Sadahiro Nishimura, Kawasaki, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

Filed Dec. 18, 1984, Ser. No. 682,910

Claims priority, application Japan, Dec. 20, 1983, 58-238838

Int. Cl.[4] C08F *210/18*

U.S. Cl. 526—282 **6 Claims**

1. A power cable coating composition comprising a copolymer of ethylene or ethylene and an α-olefin with 0.02–2 mol % of a cyclic non-conjugated diene, wherein the amount of the α-olefin copolymerized in said copolymer is in the range of 0 to 3 mol % in terms of monomer, said copolymer being prepared by a high-pressure radical polymerization process, said copolymer having a melt index of 0.2–10 g/10 min and iodine value in the range of 0.2 to 20, and not more than 2.5 parts by weight, based on 100 parts by weight of said copolymer, of a peroxide, said composition on heat-crosslinking affording a crosslinked product having at least the following properties:

(a) a percent heat-deformation at 120° C. not more than 20%, and

(b) a maximum peak temperature (Tm) not lower than 100° C. measured according to the differential scanning calorimetry (DSC).

4,599,392

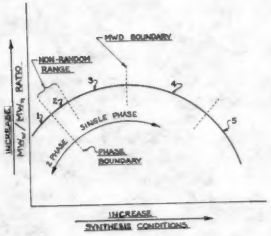
INTERPOLYMERS OF ETHYLENE AND UNSATURATED CARBOXYLIC ACIDS

Osborne K. McKinney; David P. Flores, both of Lake Jackson, and David A. Eversdyk, Angleton, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 13, 1983, Ser. No. 504,032

Int. Cl.[4] C08F *20/06, 120/06*

U.S. Cl. 526—318.6 **38 Claims**



1. A process for producing homogeneous, random interpolymers comprising about 99% to about 65% by weight of ethylene monomer and about 1% to about 35% by weight of at least one olefinically unsaturated comonomer selected from the group comprising unsaturated carboxylic acids, alkylacrylates, alkyl methacrylates and vinyl esters, said process comprising interpolymerizing the monomers in a substantially constant constant environment, under steady state conditions, in a single-phase reaction mixture, under the influence of a free-radical initiator, and in a well-stirred autoclave reactor operated in a continuous manner as the monomers are fed into the reactor and the raection mixture is withdrawn, said process being characterized by

the use of synthesis conditions of temperature and pressure which are elevated to a level high enough above the phase boundary between two-phase and single-phase operation such that the molecular weight distribution (MWD) boundary is reached, or surpassed, the said molecular weight distribution boundary being the highest ratio of weight average molecular weight/number average molecular weight obtainable in single-phase operation, said elevated pressure being greater than 2000 psi above, and said elevated temperature

being greater than 15° C. above the synthesis conditions required at the phase boundary for a given mixture of ethylene and comonomer,

thereby producing an interpolymer having less gels and/or grain.

4,599,393

METHOD FOR POLYMERIZING LACTAMS AND PRODUCTS OBTAINED THEREFROM

Peter P. Policastro, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 29, 1985, Ser. No. 728,136
Int. Cl.[4] C08G 77/06
U.S. Cl. 528—12 10 Claims

1. A method for polymerizing lactam, which comprises, heating in the presence of an effective amount of a fluoride ion containing catalyst, a lactam polymerization promoter, and a silicon containing lactam material selected from a member of the class consisting of

(A) 0.01 to 100 mole percent of silicon-lactam and 99.99 to 0 mole percent of lactam, and

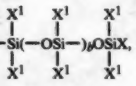
(B) a blend comprising a mixture of lactam, and 0.01 to 1 mole, per mole of lactam of a silicon containing material selected from the class consisting of

(i) silanes or organopolysiloxanes having at least one —OR radical attached to silicon, and

(ii) silylating agents selected from the class consisting of silanes having a boiling point of at least 25° C. and included within the formula

$$(R^5)_bSiX_{4-b},$$

and polydiorganosiloxanes included withiin the formula



where R is a $C_{(1-8)}$ aliphatic hydrocarbon radical or substituted $C_{(1-8)}$ aliphatic hydrocarbon radical, the silicon lactam of (A) has at least 1 silicon atom attached to a lactam ring by a silicon-nitrogen linkage and such silicon lactam is a member selected from the class consisting of silanes, organosiloxanes, cycloorganosiloxanes, organopolysilanes, polysilalkylenes, polysilarylenes, organosilazanes and cycloorganosilazanes, X is a member selected from the class consisting of carbamato, amido, amino, ureido, and imido R^5 is a member selected from the class consisting of $C_{(1-13)}$ monovalent hydrocarbon radicals, and substituted $C_{(1-13)}$ monovalent hydrocarbon radicals, X^1 is a member selected from the class consisting of R^5 and X, a has a value of 0–3 inclusive, and b has a value of 0–1000 inclusive.

4,599,394

PROCESS FOR PRODUCING ALKOXY-TERMINATED POLYSILOXANES

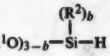
Gary M. Lucas, Scotia, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 446,233, Dec. 2, 1982. This application Aug. 28, 1985, Ser. No. 770,537
Int. Cl.[4] C08G 77/06
U.S. Cl. 528—15 4 Claims

1. A process for producing alkoxy-terminated polysiloxanes which can be used to produce RTV silicone rubber compositions, comprising anhydrously reacting

(1) a vinyl-terminated diorganopolysiloxane having a viscosity in the range of 100 to 1,000,000 centipoise at 25° C., where the organo groups are C_{1-13} monovalent substituted or unsubstituted hydrocarbon radicals with

(2) a polyalkoxy crosslinking agent of the formula



where R^1 is a C_{1-8} monovalent hydrocarbon radical, R^2 is a C_{1-13} monovalent hydrocarbon radical, and b is 0, 1 or 2; in the presence of

(3) a platinum or platinum-containing catalyst.

4,599,395

THERMOTROPIC, AROMATIC POLYESTERS HAVING GOOD MECHANICAL STRENGTH, CONTAINING SULFONIC ACID GROUPS OR METAL SULFONATE GROUPS A PROCESS FOR THE PRODUCTION THEREOF

Hans-Rudolf Dicke; Manfred Schmidt, both of Krefeld, Fed. Rep. of Germany; Mark Witman, Pittsburgh, Pa., and Aziz El-Sayed, Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 9, 1984, Ser. No. 659,160
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1983, 3338623
Int. Cl.[4] C08G 63/68
U.S. Cl. 528—173 7 Claims

1. A Thermotropic fully-aromatic polyester comprising co-condensed units of

(a) aromatic dicarboxylic acids,

(b) diphenols and

(c) aromatic hydroxycarboxylic acids

the mol ratio of radicals of co-condensed aromatic dicarboxylic acids to radicals of co-condensed diphenols being from 0.95 to 1.05 and the radicals of co-condensed aromatic hydroxycarboxylic acids amounting to up to 100 mol %, based on co-condensed radicals (a)+(c), characterised in that the polyesters contain from 0.02 to 30% by weight, based on polyester, of sulphonic acid and/or metal sulphonate groups, (calculated as sulphonic acid groups) which are bound to aromatic rings of the polyester.

4,599,396

CRYSTALLINE POLYETHERIMIDES AND POLYAMIC ACID PRECURSORS THEREFOR

Tohru Takekoshi, Scotia, and Patricia P. Anderson, Albany, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 4, 1984, Ser. No. 647,286
Int. Cl.[4] C08G 73/10
U.S. Cl. 528—185 20 Claims

1. A polymer selected from the group consisting of crystalline polyetherimides having equilibrium melting points below 400° C. and polyamic acid precursors therefor, said polymer consisting essentially of structural units of formula I in the drawings, wherein A^1 is the 1,4-phenylene radical, A^2 is the 4,4'-biphenylene, bis(4-phenylene)ether or bis(4-phenylene)sulfide radical, and X is OH and Y is NH or X and Y taken together are N.

4,599,397

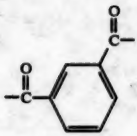
WHOLLY AROMATIC POLYESTER AND PROCESS FOR PRODUCING THE SAME

Tamotsu Yoshimura, Machida; Masahiko Nakamura, Tokyo, and Atsushi Kasai, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

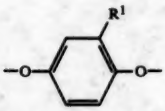
Filed Dec. 19, 1984, Ser. No. 683,518
Claims priority, application Japan, Jul. 6, 1984, 49-140391
Int. Cl.[4] C08G 63/18
U.S. Cl. 528—190 20 Claims

1. A wholly aromatic polyester consisting essentially of structural units represented by the formulae (A), (B), (C), (D) and (E):

(A)

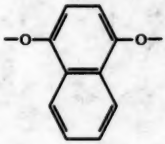


(B)



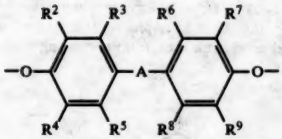
(C)

wherein R^1 represents a halogen atom, a hydrocarbon group, an alkoxy group or a phenoxy group,



(D)

and



(E)

wherein A represents an oxygen atom, a sulfur atom, a sulfonyl group, a carbonyl group, an alkylene group or an alkylidene group, or a single bond directly connecting the two benzene rings and R^2, R^3, R^4, R^5, R^6, R^7, R^8 and R^9 represent respectively a hydrogen atom, a halogen atom or a hydrocarbon group,

the wholly aromatic polyester containing 5 to 50 mol % of the unit (A), 5 to 45 mol % of the unit (B), 5 to 45 mol % of the unit (C), 5 to 20 mol % of the unit (D) and 0 to 10 mol % of the unit (E), and the sum of the amounts of the unit (A) and the unit (B) and the sum of the amounts of the unit (C), the unit (D) and the unit (E) being substantially equimolar.

4,599,398

A METHOD OF MOLDING POLYMERIZABLE COMPOSITION COMPRISING LACTAM MONOMER, CATALYST AND INITIATOR

Robert B. Hodek, Gibsonia, and Jerome A. Seiner, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 518,161, Jul. 28, 1983, Pat. No. 4,501,821. This application Sep. 21, 1984, Ser. No. 652,699

Int. Cl.[4] C08G 69/20

U.S. Cl. 528—312 **11 Claims**

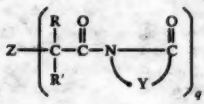
1. In a method of molding, comprising:

(I) depositing in a mold a charge of a polymerizable composition, comprising lactam monomer, initiator, and catalyst;

(II) polymerizing the charge while in the mold so as to form an at least partially cured article;

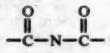
(III) removing the article from the mold, wherein the improvement comprises utilizing as the initiator and catalyst components a Grignard catalyst for lactam polymerization and an initiator system comprising:

(a) at least one material represented by the following structural formula:



(b) at least one material represented by the following structural formula:

wherein q and v are independently an integer of at least 1; Z and W are independently selected from a compound or polymeric material, said compound being composed of at least two elements in chemical combination which contain up to two repeating structural units, said polymeric material being a macromolecule formed by the chemical union of at least two coreactants and having at least three repeating structural units; with the proviso that at least a portion of either or both the materials (a) or (b) is a polymeric material; R, R', R'', R''' are independently hydrogen, a C_1 to C_{10} aliphatic radical, C_3 to C_{10} cycloaliphatic radical, C_6 to C_{10} aryl or alkaryl radical, and independently R and R'' and the carbon to which each is attached are included as part of a cycloaliphatic or aromatic ring; and Y is an alkylene group having from 3 to 12 carbon atoms or an alkylene group having from 3 to 12 carbon atoms interrupted by a heteroatom; with the proviso that the equivalent ratio



groups to the magnesium of the Grignard catalyst is within the range of from 0.3 to 1 to 4 to 1, and at least 10 percent of the initiator groups of the initiator system are of the (a) type.

4,599,399

PROCESS FOR THE PREPARATION OF POLY[3,6-N-SUBSTITUTED CARBAZOLE-1,3,4-OXADIAZOLE-2,5-DIYL] FROM N-SUBSTITUTED CARBAZOLE-3,6-DICARBOXYLIC ACID

Victor P. Kurkov, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 25, 1984, Ser. No. 664,829

Int. Cl.[4] C08G 73/06, 73/08

U.S. Cl. 528—313 **8 Claims**

1. A process for the preparation of poly[3,6-N-substituted carbazole-1,3,4-oxadiazole-2,5-diyl] which comprises polymerizing N-substituted carbazole-3,6-dicarboxylic acid, wherein the carbazole nitrogen is substituted with lower alkyl of 1 to 6 carbon atoms or phenyl, with a 0 to 30% molar excess of hydrazine or a hydrazine salt of a non-oxidizing acid in the presence of polyphosphoric acid at a temperature in the range of about 120° C. to 180° C. and a pressure in the range of about 1 to 50 atmospheres.

4,599,400

STAR/COMB-BRANCHED POLYAMIDE

Donald A. Tomalia, and Mark J. Hall, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 18, 1984, Ser. No. 683,299
Int. Cl.[4] C08G 69/00
U.S. Cl. 528—405 **6 Claims**

1. A star/comb-branched polyamide having at least 3 branches emanating from the residue of a core compound wherein each branch has a plurality of amide moieties in which each such amide moiety has its amide nitrogen in the chain of the branch and each such amide nitrogen bears a pendant carbonyl moiety, said amide moieties being hydrolyzable to form amine moieties without cleaving the chain of the branch.

4,599,401

LOW VISCOSITY ADDUCTS OF POLY(ACTIVE HYDROGEN) ORGANIC COMPOUNDS AND A POLYEPOXIDE

Joseph V. Koleske, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 27, 1983, Ser. No. 546,112
Int. Cl.[4] C08G 59/00, 59/68, 65/04
U.S. Cl. 528—408 **41 Claims**

1. An adduct of at least two poly(active hydrogen) organic compounds and a polyepoxide comprising the reaction product of at least two poly(active hydrogen) organic compounds differing as to classification and a polyepoxide containing two or more epoxy groups per molecule in a molar ratio of poly(active hydrogen) organic compounds to polyepoxide of about 2:1 to about 3:1, said adduct having an oxirane content of less than about 0.05 percent and a viscosity of less than about 3500 centistokes at 54.5° C.

18. A process for preparing a low viscosity adduct of at least two poly(active hydrogen) organic compounds and a polyepoxide which process comprises reacting at least two poly(active hydrogen) organic compounds differing as to classification and a polyepoxide containing two or more epoxy groups per molecule in the presence of a sulfonic acid catalyst or derivative thereof at a temperature of from about 80° C. to about 225° C., said poly(active hydrogen) organic compounds, polyepoxide and sulfonic acid catalyst or derivative thereof being employed in an amount at least sufficient to effect substantially complete reaction of the epoxy groups of the polyepoxide in a sufficiently short period of time whereby to minimize the formation of a high viscosity product.

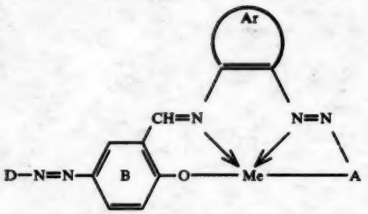
4,599,402

METAL COMPLEX DYES CONTAINING AZO AZOMETHINE GROUPS

Johannes Dehnert, Ludwigshafen, and Werner Jünemann, Bad Durkheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

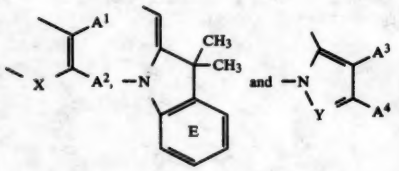
Filed Oct. 12, 1984, Ser. No. 660,124
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1983, 3337591
Int. Cl.[4] C09B 45/04, 45/22, 45/18, 45/30
U.S. Cl. 534—700 **7 Claims**

1. A compound of the formula I



wherein

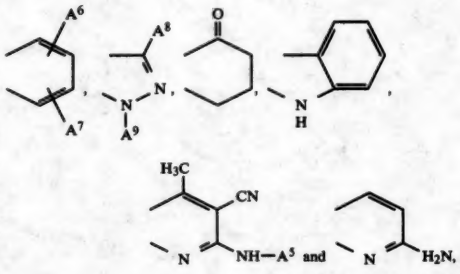
A is a radical of a coupling or diazo component selected from the group consisting of



wherein

A^1 is (C_2–C_3)alkanoyl, benzoyl, (C_2)alkylaminocarbonyl or phenylaminocarbonyl, which are substituted by H_1, CH_3, Cl or OCH_3, A^2 is (C_1–C_2)alkyl or phenyl, or

A^1 and A^2 together form an aliphatic, aromatic or heterocyclic ring selected from the group consisting of



wherein

A^5 is hydrogen, (C_1–C_4)alkyl, β-methoxyethyl, γ-methoxypropyl or benzyl;

A^6 is hydrogen, (C_1–C_2)alkyl, chlorine, bromine, nitro or phenylazo substituted by H, chlorine, bromine, methyl, methoxy, nitro or cyano, A^7 is hydrogen, chlorine or methyl, or

A^6 and A^7 together complete a benzo ring;

A^8 is hydrogen, methyl, phenyl or (C_1–C_4)alkoxycarbonyl;

A^9 is hydrogen, (C_1–C_4)alkyl, (C_1–C_4)cycloalkyl, (C_5–C_8)aralkyl, (C_5–C_8)heteroaralkyl or phenyl, which are substituted by H, (C_1–C_2)alkoxy, Cl, NO_2, Br or CH_3;

A^3 is hydrogen or (C_1–C_2)alkyl, A^4 is hydrogen, (C_1–C_4)alkoxycarbonyl, (C_1–C_2)alkyl or phenyl, or

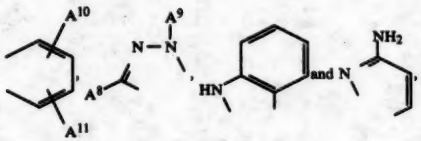
A^3 and A^4 together form tetramethylene or complete a benzo ring substituted by H, Cl or NO_2;

X is —O— or

Y is —N= or

the ring E is substituted by H or chlorine;

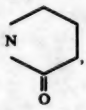
Ar is an aromatic or heterocyclic radical selected from the group consisting of



wherein

A^{10} is hydrogen, chlorine, bromine, $(C_1–C_2)$alkyl, $(C_1–C_4)$alkoxy, phenylazo, mono- or di-$(C_1–C_4)$amino which is substituted by H, $—OCH_3$ or Cl, $—OC_6H_5$, $—OCH_2C_6H_5$, $—OC_2H_4OC_6H_5$,

$NHCOCH_3$, $NHCOC_2H_5$,



$N(CH_3)C_2H_4CN$, $N(C_2H_5)C_2H_4CN$, or $N(CH_2CH=CH_2)C_2H_4CN$, A^{11} is hydrogen, methyl, or chlorine, or

A^{10} and A^{11} together complete a benzo ring;

D is a radical of a diazo component;

Me is a Co^{2+}, Cu^{2+}, Zn^{2+}, Mn^{2+} or Ni^{2+} ion; and

the ring B is substituted by H, $(C_1–C_4)$alkyl, $(C_1–C_2)$alkoxyl, chlorine or bromine.

4,599,403

METHOD FOR RECOVERY OF STEVIOSIDE

Sampath Kumar, Lincroft, N.J., assignor to Harold Levy; Harry W. Sorkin; Edna Y. Rogers, all of New York, N.Y. and Charles F. Bruno, East Brunswick, N.J.

Filed Oct. 7, 1985, Ser. No. 785,200
Int. Cl.[4] C07H *1/08*
U.S. Cl. 536—18.1 17 Claims

1. A method for the recovery of stevioside from leaves of *Stevia rebaudiana* Bertoni which comprises the following sequential steps:

(a) contacting said leaves with hot water to obtain an aqueous extract containing stevioside;

(b) admixing said aqueous extract with a chelating agent whereby the pH of the aqueous extract is lowered to less than about pH 4 and metallic impurities are chelated and then separated from the aqueous extract;

(c) contacting the thus treated aqueous extract with a base to precipitate salts of the chelating agent, protein impurities and colored impurities, and separating said precipitates from the aqueous extract;

(d) treating the resulting aqueous extract, having a basic pH, with an acid essentially to neutralize the aqueous extract;

(e) contacting the neutralized aqueous extract with a water-immiscible, organic solvent, and separating the resulting solvent layer from the aqueous layer;

(f) cooling the aqueous layer to a temperature sufficient to crystallize stevioside therefrom; and

(g) separating stevioside crystals from the cooled aqueous layer.

4,599,404

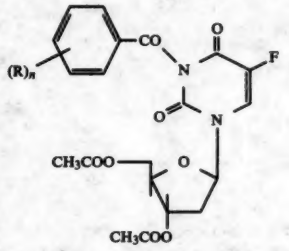
2-DEOXY-5-FLUOROURIDINE DERIVATIVE AND A PROCESS FOR PRODUCING THE SAME AND AN ANTITUMOR AGENT COMPRISING THE SAME

Setsuro Fujii, Toyonaka, and Eiichi Sakakibara, Kobe, both of Japan, assignors to Funai Pharmaceutical Ind., Ltd., Osaka, Japan

Filed Aug. 21, 1979, Ser. No. 68,340
Claims priority, application Japan, Sep. 5, 1978, 53-108955
Int. Cl.[4] C07H *19/073*; A61K *31/70*
U.S. Cl. 536—23 18 Claims

1. A 2'-deoxy-5-fluorouridine derivative represented by the general formula (I);

(I)



wherein R represents a hydrogen atom, an alkyl group having 1 to 5 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, an acetyloxy group or a halogen atom, and n is an integer of 1 to 3.

4,599,405

PROCESS FOR THE PRODUCTION OF IRON(III)HYDROXIDE/DEXTRAN COMPLEXES AND A STERILE PHARMACEUTICAL SOLUTION CONTAINING THEM

Arthur Müller, St. Gall, and Walter Richle, Lustmühle, both of Switzerland, assignors to Laboratorien Hausmann AG, St. Gall, Switzerland

Continuation of Ser. No. 283,146, Jul. 14, 1981, abandoned. This application Dec. 28, 1984, Ser. No. 687,152
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1980, 3026868
Int. Cl.[4] C08B *37/02*
U.S. Cl. 536—113 11 Claims

1. A process for producing stable, sterile aqueous pharmaceutical solution for the treatment of iron deficiencies containing the iron(III)hydroxide/dextran complex comprising:

(a) dissolving dextran having an average molecular weight of from 3,000 to 6,000 in water;

(b) cooling the dextran solution to a temperature of less than 40° C.;

(c) adding the cooled dextran solution to a solution of $FeCl_3$ at a temperature of less than 40° C. to form a mixed solution having a weight ratio of from 50 to 100 kg of iron ions per 100 kg of dextran;

(d) adding from 2.0 to 2.6 vals of carbonate selected from the group consisting of alkali metal carbonates, ammonium carbonate and carbonates of organic bases inert to the reaction components to said mixed solution over a period of more than two hours;

(e) adding an alkali metal hydroxide or ammonium hydroxide to the solution of step (d) to yield a suspension having a pH of at least about 10.5;

(f) recovering the iron(III)/dextran complex;

(g) dissolving said iron(III)/dextran complex in water to yield a stable solution having an iron content of at least 15% W/V.

4,599,406

PROCESS FOR PREPARING 2-METHYL-N-(2-PYRIDYL)-2H-1,2-BENZOTHIAZINE-3-CARBOXAMIDE 1,1-DIOXIDE DERIVATIVES AND INTERMEDIATES THEREFOR

Tiberio Bruzzese; Ernani Dell'Acqua, both of Milan; Franco Ottoni, Cesano Boscone, and Holger H. van den Heuvel, Milan, all of Italy, assignors to SPA-Societa Prodotti Antibiotici spa, Milan, Italy

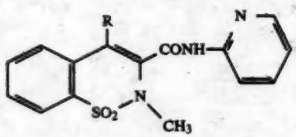
Filed Dec. 13, 1984, Ser. No. 681,186

Claims priority, application Italy, Dec. 16, 1983, 24214 A

Int. Cl.[4] C07D *279/02*

U.S. Cl. 544—49 **14 Claims**

1. A process for preparing derivatives of 2-methyl-N-(2-pyridyl)-2H-1,2-benzothiazine-3-carboxamide 1,1-dioxide of the formula:



wherein R represents OH or a OR_1 group in which R_1 is cinnamoyl, which comprises reacting a strong base salt of 4-hydroxy-2-methyl-2H-1,2-benzothiazine-3-carboxylic acid 1,1-dioxide with cinnamoyl chloride, to give the corresponding anhydride which is unesterified or esterified at position 4; and reacting the obtained anhydride with 2-aminopyridine.

4,599,407

THIOHYDRAZINE-1,2-DICARBOXYLIC ACID DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Erich Wunsch, Tutzing, Fed. Rep. of Germany, assignor to Max Planck Gesellschaft zur Forderung der Wissenschaften e.V., Fed. Rep. of Germany

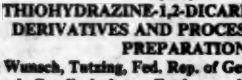
Continuation of Ser. No. 538,350, Oct. 3, 1983, abandoned. This application Aug. 5, 1985, Ser. No. 762,819

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1982, 3236849

Int. Cl.[4] C07C *161/00*; C07D *265/28*

U.S. Cl. 544—85 **7 Claims**

1. A 1-tert.-alkyl-thiohydrazine-1,2-dicarboxylic acid derivative of the general formula I



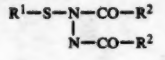
(I)

in which

R^1 is a tertiary butyl or a tertiary amyl group, and

R^2 is an ester or amide residue.

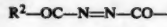
4. A process for the preparation of a compound of the general formula



in which R^1 is a tertiary alkyl group and R^2 is an ester or amide residue, wherein a tert.-alkylmercaptan of the general formula II

(II)

in which R^1 is as previously defined, is reacted with an azodicarboxylic acid derivative of the general formula III



(III)

in which R^2 is as previously defined, in an inert, aprotic solvent in the presence of a catalytic amount of a very strong base.

4,599,408

PERYLENE-3,4,9,10-TETRACARBOXYLIC ACID MONOANHYDRIDE MONOIMIDES

Ernst Spietschka, Idstein, and Helmut Tröster, Königstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

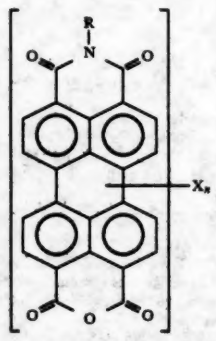
Continuation of Ser. No. 261,454, May 7, 1981, abandoned. This application Apr. 11, 1984, Ser. No. 599,202

Claims priority, application Fed. Rep. of Germany, May 5, 1980, 3017185

Int. Cl.[4] C07D *491/06*

U.S. Cl. 544—125 **4 Claims**

1. A compound of the formula



in which R is hydrogen, amino, cycloalkyl of 4 to 8 carbon atoms, or alkyl of 1 to 8 carbon atoms which is unsubstituted or substituted by cycloalkyl of 4 to 8 carbon atoms, cyano, hydroxy, carbamoyl, lower dialkylamino, morpholyl, phenyl which is unsubstituted or substituted by halogen or lower alkyl, or alkoxy of 1 to 8 carbon atoms which is unsubstituted or substituted by lower alkoxy;

X is chlorine or bromine;

n is a number from 0 to 2; and

R is not hydrogen or unsubstituted alkyl when n is the number 0.

4,599,409

BISAMIDINE DERIVATIVES OF 5,10-DIOXO-4,5,9,10-TETRAHYDRO-4,9-DIOXOPYRENES, OF 6(5H)-PHENANTHRIDONES, AND OF PHENANTHRIDINES, USEFUL AS CHEMOTHERAPEUTIC AGENTS

Balbir S. Bajwa, deceased, late of Bombay (by Sarabjeet Bajwa, Surjeet K. Bajwa, heirs); Dipak K. Chatterjee, Bombay; Bimal N. Ganguli, Bombay; Jürgen Reden, Bombay, and Noel J. de Souza, Bombay, all of India, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

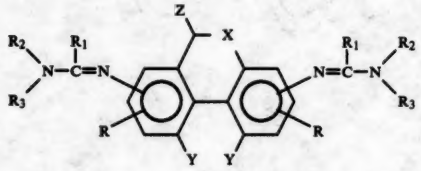
Filed Feb. 15, 1984, Ser. No. 580,181

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1983, 3305329

Int. Cl.[4] C07D *413/00, 403/00, 493/06*

U.S. Cl. 544—126 6 Claims

1. A compound of the formula I



I

in which

R denotes hydrogen, C_1–C_3-alkyl, C_1–C_3-alkoxy, halogen, nitro or amino,

R_1 denotes hydrogen, a C_1–C_6-alkyl group which is unsubstituted or substituted by the amino or di-C_1–C_3-alkylamino group, or a di-C_1–C_3-alkylamino group,

R_2 and R_3 individually denote a C_1–C_6-alkyl group or, together with the nitrogen atom to which they are attached, denote pyrrolidine, piperidine, imidazoline or pyrimidine, or R_1 and R_2, together with the carbon atom and the nitrogen atom to which they are attached, denote pyrrolidine or piperidine,

X and Z each denote oxygen or

X represents the —NH— group and Z represents oxygen or

X represents nitrogen and Z represents hydrogen, halogen, C_1–C_6-alkoxy, amino, mono-C_1–C_6-alkylamino, di-C_1–C_6-alkylamino, N-alkyl substituted piperazine, piperidine, morpholine, pyrrolidine, or alkyl or phenyl substituted piperidine, and Y represents hydrogen or, if X and Z each denote oxygen, represents the bridge

which forms an additional ring system,

and pharmaceutically acceptable salts thereof.

6. The use of a compound of the formula I as claimed in claim 1 for combating protozoal infections.

4,599,410

OXACHALCOGENAZOLE DYES AND PROCESSES FOR THEIR PREPARATION

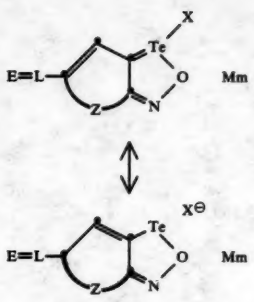
Wolfgang H. H. Gunther, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 19, 1985, Ser. No. 702,693

Int. Cl.[4] C07D *293/10*

U.S. Cl. 544—137 23 Claims

1. A methine dye represented in alternate resonance forms by the formulae:



Mm

wherein

E represents an auxochrome;

L represents a methine linkage completing a conjugated resonance chromophore extending from said auxochrome to the tellurium atom of said formulae;

M represents a charge balancing counterion;

m is zero or 1;

X represents halogen or pseudohalogen; and

Z represents the atoms completing an aromatic nucleus.

4,599,411

PROCESS FOR THE PRODUCTION OF ALKALI METAL SALTS OF DICHLOROISOCYANURIC ACID

John A. Wojtowicz, Cheshire, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed Jun. 3, 1985, Ser. No. 740,662

Int. Cl.[4] C07D *251/36*

U.S. Cl. 544—190 11 Claims

1. A process for producing a sodium dichloroisocyanurate compound which comprises admixing trichloroisocyanuric, cyanuric acid, and sodium bicarbonate to form a homogeneous mixture, reacting said homogeneous mixture with water in the form of droplets or steam, and recovering said sodium dichloroisocyanurate compound.

4,599,412

PROCESS FOR PREPARATION OF SULFONYLUREA SOLUTION FORMULATIONS

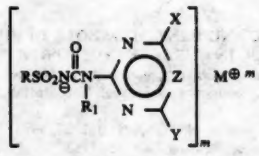
Lionel S. Sandell, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 554,787, Nov. 23, 1983, abandoned. This application Mar. 21, 1985, Ser. No. 714,508

Int. Cl.[4] C07D *251/41, 251/46, 239/69*

U.S. Cl. 544—211 32 Claims

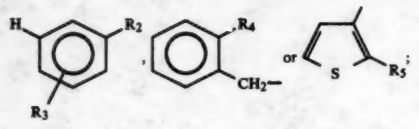
1. A process for stabilizing a solution formulation comprising a compound of Formula I dissolved in an aprotic solvent, which is subject to the degradative effects of moisture and impurities:



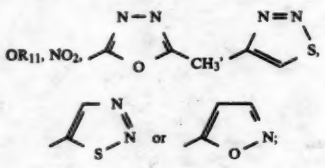
I

wherein

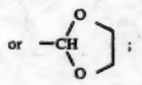
R is



R_1 is H or CH_3;
R_2 is F, Cl, Br, C_1–C_4 alkyl, $SO_2NR_6R_7$, $S(O)_nR_8$, $SO_2NCH_3(OCH_3)$, CO_2R_9, OSO_2R_{10},



R_3 is H, F, Cl, Br, CH_3, OCH_3 or CF_3;
R_4 is Cl, NO_2 or CO_2R_{10};
R_5 is Cl, Br, $SO_2NR_6R_7$, $S(O)_nR_{10}$ or CO_2R_{10};
R_6 and R_7 are independently C_1–C_3 alkyl;
R_8 is C_1–C_3 alkyl or C_1–C_3 alkyl substituted by 1–5 atoms of F, Cl or Br;
R_9 is C_1–C_4 alkyl, $CH_2CH_2OCH_3$, CH_2CH_2Cl or $CH_2CH{=}CH_2$;
R_{10} is C_1–C_3 alkyl;
R_{11} is C_1–C_4 alkyl, $CH_2CH{=}CH_2$, $CH_2C{\equiv}CH$ or C_1–C_3 alkyl substituted with 1–5 atoms of F, Cl or Br;
n is 0 or 2;
M is an agriculturally suitable cation;
m is 1, 2 or 3;
Z is CH or N;
X is CH_3, OCH_3, Cl or $OCHF_2$; and
Y is CH_3, OCH_3, $CH(OCH_3)_2$, $OCHF_2$



provided that when
X is Cl, then Z is CH and Y is OCH_3, or OCF_2H;
said process comprising contacting under adsorption conditions said solution formulation with molecular sieves having nominal pore diameters sized to adsorb water and to exclude the solvent and compound of Formula I, for a sufficient time to impart enhanced chemical stability to said solution formulation.

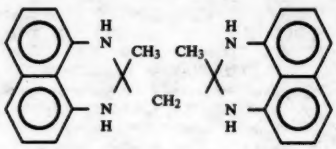
4,599,413

PERIMIDENE AND BENZIMIDAZOLE DERIVATIVES USEFUL IN CURABLE COMPOSITIONS

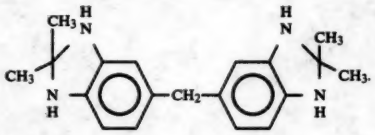
Richard J. Moulton, Clayton, and John D. Neuner, Pittsburg, both of Calif., assignors to Hexcel Corporation, San Francisco, Calif.

Continuation of Ser. No. 286,897, Jul. 27, 1981, Pat. No. 4,427,802. This application Dec. 15, 1983, Ser. No. 561,796
Int. Cl.[4] C07D *403/04, 403/06, 487/10*
U.S. Cl. 544—231 **6 Claims**

1. The compound having the formula:



6. The compound having the formula:



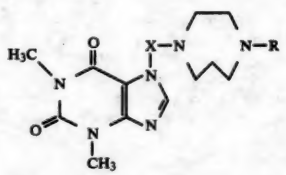
4,599,414

THEOPHYLLINE DERIVATIVES

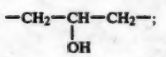
Hachiro Sugimoto, Kawaguchi; Sachiyuki Hamano, Tokyo, and Tadao Shoji, Kagamihara, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Division of Ser. No. 307,458, Oct. 1, 1981, abandoned, which is a continuation of Ser. No. 171,052, Jul. 22, 1980, abandoned. This application Sep. 1, 1983, Ser. No. 528,678
Claims priority, application Japan, Jul. 25, 1979, 54-93635
Int. Cl.[4] C07D *473/10*; A61K *31/52*
U.S. Cl. 544—267 **11 Claims**

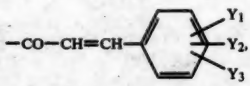
1. A compound having the formula:



wherein X is $-(CH_2)_n-$, in which n is an integer of 1 to 6, or



and R is:
(1) a group having the formula



wherein Y_1, Y_2 and Y_3, which can be the same or different, each is hydrogen, lower alkyl, lower alkoxy, lower alkylsulfonyl, halogen or nitro; or
(2)

and pharmacologically acceptable acid addition salts thereof.

4,599,415

3-(2-(2-BENZIMIDAZOLYL) BENZOLYLOXYETHYL)-4(3H)-QUINAZOLINONE

Ladmila Fisnerová; Jaroslava Grimová; Zdenek Roubal, and Oldrich Nemecek, all of Prague, Czechoslovakia, assignors to SPOFA, spojene podniky pro zdravotnickou vyrobu, Prague, Czechoslovakia

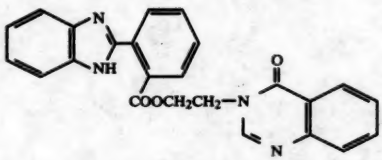
Filed Apr. 8, 1985, Ser. No. 720,744

Claims priority, application Czechoslovakia, Apr. 6, 1984, 2662-84

Int. Cl.[4] C07D *403/12*

U.S. Cl. 544—284 1 Claim

1. 3-[2-(2-Benzimidazolyl) Benzoyloxyethyl]-4(3H)-Quinazolinone of the formula



4,599,416

PROCESS FOR THE PREPARATION OF AQUEOUS SOLUTIONS OF POTENTIATED SULFONAMIDES

Ivan Kompis, Oberwil, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

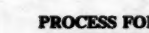
Filed Sep. 3, 1982, Ser. No. 414,694

Claims priority, application Switzerland, Sep. 23, 1981, 6140/81

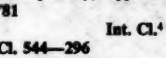
Int. Cl.[4] C07D *403/12*

U.S. Cl. 544—296 12 Claims

1. A process for the preparation of an aqueous solution of a potentiated sulfonamide based on a compound of the formula



wherein R^1 is hydrogen,



and R is an antibacterially active sulfonamide selected from the group consisting of sulfadiazine, sulfamethoxazole, sulfatroxazole, sulfamerazine, sulfadoxine, sulfadimethoxine, sulfamethazine, sulfaquinoxaline, sulfachloropyridazine, sulfalene, sulfametin, sulfamethoxine, sulfamethoxypridazine, sulfamethylphenazole, sulfaphenazole, sulfamoxole, sulfapyrazine, sulfapyridazine, sulfapyridine, sulfasymazine, and sulfametrole, bonded via the amino group,

and a sulfonamide potentiator, which process comprises dissolving a compound of formula I, a sulfonamide potentiator and, a sulfonamide salt corresponding to the compound of formula I or a sulfonamide corresponding to the sulfonamide in the compound of formula I and an amount of base equivalent to the sulfonamide in water.

4,599,417

UREIDO-FUNCTIONAL ADHESION PROMOTING AMIDE MONOMERS

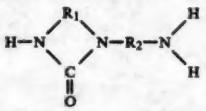
Kazys Sekmakas, Des Plaines, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Nov. 5, 1984, Ser. No. 668,156

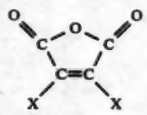
Int. Cl.[4] C07D *233/30, 239/02*

U.S. Cl. 544—316 3 Claims

1. A ureido-functional, ethylenically unsaturated copolymerizable monomer which is the adduct formed by reacting an aminoalkyl alkylene urea having the formula:



in which R_1 is alkylene having 2 or 3 carbon atoms; and R_2 is alkylene having 2 to 10 carbon atoms, with a maleic anhydride compound having the formula:



where X is selected from hydrogen, C_1-C_4 alkyl, and halogen, to form an unsaturated carboxyl-functional amide, the adduction reaction being carried out in solution in N-methyl pyrollidone at a temperature in the range of 80° C. to 130° C.

4,599,418

BENZOQUINOLIZINE CARBOXYLIC ACID DERIVATIVES, AND PROCESS FOR PREPARATION THEREOF

Tsutomu Irikura, Tokyo; Satoshi Murayama, and Fjuio Iinuma, both of Tochigi, all of Japan, assignors to Kyorin Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1984, Ser. No. 581,957

Claims priority, application Japan, Feb. 22, 1983, 58-28135

Int. Cl.[4] C07D *401/04, 455/06;* A61K *31/495*

U.S. Cl. 544—361 1 Claim

1. 8-[4-(4-Aminobenzyl)-1-piperazinyl]-9-fluoro-6,7-dihydro-5-methyl-1-oxo-1H,5H-benzo[ij]-quinolizine-2-carboxylc acid, hydrates and acid addition salts thereof.

4,599,419

PHARMACEUTICALLY ACTIVE (3-CYCLIC AMINOPROPOXY)BIBENZYLS AS INHIBITORS OF PLATELET AGGREGATION

Ryoji Kikumoto, Machida; Harukazu Fukami, Yokohama; Hiroto Hara; Kunihiro Ninomiya, both of Machida, and Mamoru Sugano, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries, Inc., Tokyo, Japan

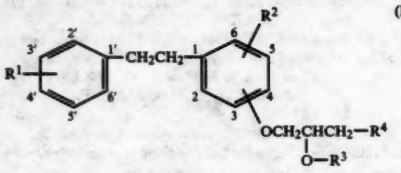
Division of Ser. No. 403,119, Jul. 29, 1982, Pat. No. 4,485,258. This application Jul. 9, 1984, Ser. No. 629,061

Claims priority, application Japan, Aug. 20, 1981, 56-130704

Int. Cl.[4] C07D *241/04;* A61K *31/505*

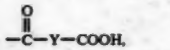
U.S. Cl. 544—391 11 Claims

1. A (3-aminopropoxy)bibenzyl compound of the formula (I):

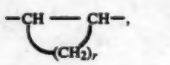


(I)

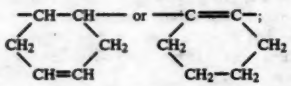
wherein R^1 and R^2 independently are hydrogen, halogen, C_1–C_5 alkyl, C_1–C_5 alkoxy or C_2–C_6 dialkylamino; R^3 is hydrogen, $-(CH_2)_n-COOH$, where n is an integer of 1 to 5, or



where Y is $-(CH_2)_m-$ with m being an integer of 1 to 3, C_4–C_6 cycloalkylene of the formula:



where r is an integer of 2 to 4, or cyclohexenylene of the formula:



and R^4 is

wherein A is a divalent group which has at least two groups selected from the group consisting of $-CH_2-$ and

where R^7 is C_1–C_5 alkyl or carbamoyl of the formula: $-CONH_2$ and zero or one group selected from the group consisting of

and

where R^8 is C_1–C_5 alkyl, which are combined in an arbitrary order to form a ring, the number of the combined groups being up to 9, or a pharmaceutically acceptable acid addition salt thereof.

11. A method of inhibiting platelet aggregation in blood of warm blooded animals, which comprises: administering to said animal an effective amount of a compound of claim 1.

4,599,420

AZABICYCLIC INTERMEDIATES FOR PHARMACEUTICAL COMPOUNDS

Michael S. Hadley, Sawbridgeworth, and Francis D. King, Newport, both of England, assignors to Beecham Group Ltd., England

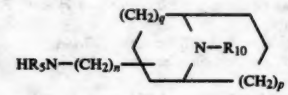
Division of Ser. No. 271,990, Jun. 9, 1981, Pat. No. 4,544,660, which is a continuation-in-part of Ser. No. 107,413, Dec. 26, 1979, Pat. No. 4,273,778. This application Feb. 25, 1983, Ser. No. 469,681

Claims priority, application United Kingdom, Dec. 30, 1978, 50380/78; Mar. 15, 1979, 7909262; Aug. 9, 1979, 7927831

Int. Cl.[4] C07D *451/14*

U.S. Cl. 546—124 5 Claims

1. An azabicyclo (3.2.1) octane having the formula (XIII):



(XIII)

wherein n is 0, p is 0 and q is 1, R_5 is hydrogen, and R_{10} is a group $-(CH_2)_tR_8$ wherein t is 1 or 2 and R_8 is a phenyl group optionally substituted by one or two substituents selected from C_{1-6} alkyl, C_{1-4} alkoxy, trifluoromethyl and halogen.

4,599,421

PROCESS FOR THE PREPARATION OF A PYRIDONE-2

Roland E. van der Stoel, Buchten, and Marcel A. R. Bosma, Geleen, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

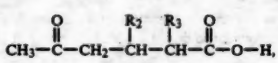
Filed Apr. 17, 1984, Ser. No. 601,342

Claims priority, application Netherlands, Apr. 22, 1983, 8301416

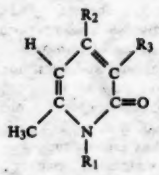
Int. Cl.[4] C07D *211/88*

U.S. Cl. 546—251 8 Claims

1. Process for the preparation of a pyridone-2, wherein an oxoalkanecarboxylic acid having as general formula



where R_2 and R_3 represent hydrogen or an alkyl group having 1–4C atoms, or a C_1 to C_3 lower alkyl ester of such an acid is reacted in the gas phase with an amine compound R_1NH_2, where R_1 represents hydrogen or an alkyl group with 1–4C atoms, at a temperature of 250°–450° C. in presence of a dehydrogenating catalyst which is a metal or compound of a metal from the 8th group or 1st auxiliary group of the periodic system of elements according to Mendeleef, to form a pyridone-2 having as general formula



where R_1, R_2 and R_3 have the meanings described above.

4,599,422

MANUFACTURE OF PYRIDINE

Ronald L. Amey, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 27, 1984, Ser. No. 655,087
Int. Cl.[4] C07D *213/02*
U.S. Cl. 546—251 4 Claims

1. A process for the preparation of pyridine which comprises heating a pentenenitrile in an inert gas reaction medium at a temperature in the range 500°–600° C. in the presence of a catalyst consisting essentially of a compound selected from the class consisting of molybdenum oxide, tungsten oxide, zirconium oxide, vanadium pentoxide, cobalt molybdate, nickel molybdate, bismuth molybdate and mixtures thereof.

4,599,423

PREPARATION OF 5-(HYDROXY- AND/OR AMINOPHENYL-6-LOWER-ALKYL)-2(1H)-PYRIDINONES

George Y. Lesher; Chester J. Opalka, Jr., both of Schodack; Donald F. Page, East Greenbush, and Ruthann M. McGarry, Schodack, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 372,174, Apr. 26, 1982, Pat. No. 4,465,686, which is a continuation-in-part of Ser. No. 300,294, Sep. 8, 1981, abandoned. This application Apr. 2, 1984, Ser. No. 595,751
Int. Cl.[4] C07D *211/76*
U.S. Cl. 546—300 8 Claims

1. The process which comprises refluxing a 1-R_1-1,2-dihydro-2-oxo-5-(3-R′-4-R″-phenyl)-6-R-nicotinonitrile, where R_1 is hydrogen, lower-alkyl or lower-hydroxyalkyl, R is hydrogen or lower-alkyl, R′ is hydrogen, hydroxy, methoxy or amino and R″ is hydroxy, methoxy or hydrogen, or where R′ is nitro when R″ is hydroxy or methoxy, with a multi-molar excess of 85% phosphoric acid to produce 1-R_1-5-(3-R′-4R″-phenyl)-6-R-2(1H)-pyridinone, where $R_1$and R have the meanings given above, R′ is hydrogen, hydroxy or amino and R″ is hydroxy or hydrogen, at least one of R′ and R″ being hydroxy, or where R′ is nitro when R″ is hydroxy.

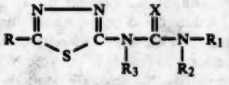
4,599,424

5-SUBSTITUTED THIADIAZOLE UREAS AND THEIR USE AS HERBICIDES

Patrick R. Driscoll, Spotswood, N.J., assignor to Rhone-Poulenc, Inc., Monmouth Junction, N.J.

Continuation of Ser. No. 863,368, Dec. 22, 1977, abandoned, which is a division of Ser. No. 316,794, Dec. 20, 1972, which is a division of Ser. No. 296,389, Oct. 10, 1972, which is a continuation-in-part of Ser. No. 71,248, Sep. 10, 1970, abandoned, which is a division of Ser. No. 818,078, Apr. 21, 1969, abandoned, which is a continuation-in-part of Ser. No. 782,756, Dec. 10, 1968, abandoned, which is a continuation-in-part of Ser. No. 702,189, Feb. 1, 1968, abandoned. This application Oct. 3, 1979, Ser. No. 81,423
Int. Cl.[4] A01N *47/36*; C07D *285/12, 417/12*
U.S. Cl. 548—140 3 Claims

1. A compound of the formula:



wherein R is alkoxy; R_1 is selected from the group consisting of H, alkyl (C_1–C_4), and cycloalkyl (C_3–C_6); R_2 is from the group consisting of H, alkyl (C_1–C_4), haloalkyl (C_1–C_4), alkoxy (C_1–C_4), alkeryl (C_2–C_4), alkynyl (C_2–C_4), aryl, and haloaryl, and wherein R_1 and R_2 are alkylene which, together with N, form a ring of at least 3, but not more than 6 members; R_3 is H or alkyl (C_1-$_6$); and X is selected from the group consisting of oxygen and sulfur.

4,599,425

BIS-[2,5-DITHIO-1,3,4-THIADIAZOLE] AND A PROCESS FOR ITS PRODUCTION

Peter Hugo, and Rainer Noack, both of Berlin, Fed. Rep. of Germany, assignors to Rhein-Chemie Rheinau GmbH, Mannheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 640,618, Aug. 14, 1984, abandoned. This application Oct. 18, 1984, Ser. No. 662,141
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1983, 3330919
Int. Cl.[4] C07D *513/18*
U.S. Cl. 548—142 4 Claims

1. Bis-[2,5-dithio-1,3,4-thiadiazole] corresponding to the following formula:

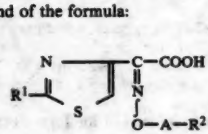
4,599,426

AMINO THIAZOLE COMPOUNDS

Takashi Kamiya, Suita; Kunihiko Tanaka, Toyonaka; Tsutomu Teraji, Osaka, and Yoshiharu Nakai, Ohtsu, all of Japan, assignors to Fujisawa Pharmaceutical Co., Osaka, Japan

Division of Ser. No. 258,661, Apr. 29, 1981, Pat. No. 4,506,076, which is a division of Ser. No. 56,504, Jul. 11, 1979, Pat. No. 4,288,435. This application Sep. 13, 1983, Ser. No. 531,669
Claims priority, application United Kingdom, Jul. 17, 1978, 30080/78
Int. Cl.[4] C07D *277/42, 277/44*
U.S. Cl. 548—195 6 Claims

1. A compound of the formula:



wherein

R^1 is amino or lower alkanoylamino;

R^2 is —CONH—R^5 or —NHCO—R^5′

R^5 is phenyl having one halogen, one carboxy or one lower alkoxycarbonyl, phenyl having one halogen and one hydroxy, or phenyl having two halogens and one hydroxy;

R^5′ is phenyl having one halogen and one hydroxy; and

A is methylene or ethylene;

or a pharmaceutically acceptable salt thereof.

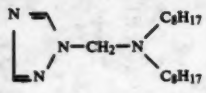
4,599,427

MICROBICIDAL AZOLYLMETHYLAMINES

Siegfried Oeckl, Bergisch-Gladbach; Hans-Georg Schmitt, Leverkusen; Wilfried Paulus, and Hermann Genth, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 28, 1983, Ser. No. 536,929
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1982, 3238006
Int. Cl.[4] A01N *43/50, 43/653, 43/80*; C07D *249/08*
U.S. Cl. 548—262 1 Claim

1. An azolylmethylamine of the formula



4,599,428

PROCESS FOR THE PREPARATION OF 5(6)-THIO SUBSTITUTED BENZIMIDAZOLES

Csaba Gönczi; Dezsö Korbonits; Endre Pálosi; Pál Kiss; Gergely Héja; Judit Kun; Mária Szomor née Wundele; Ida Szvoboda née Kaszel; Ede Márványos; Károly Horváth; Vera Kovács née Mindler, and Livia Nagy née Korányi, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT, Budapest, Hungary

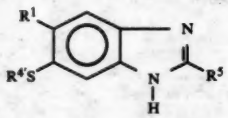
Division of Ser. No. 458,266, Jan. 17, 1983, Pat. No. 4,473,697, which is a continuation of Ser. No. 259,544, May 1, 1981, abandoned, which is a division of Ser. No. 198,150, Oct. 17, 1980, abandoned. This application Mar. 21, 1984, Ser. No. 591,767

Claims priority, application Hungary, Oct. 19, 1979, CI 1975; Mar. 19, 1980, 635/80; Apr. 22, 1980, CI 1975; Jun. 3, 1980, 1387/80; Jul. 11, 1980, CI 1975; Sep. 17, 1980, 835/80

Int. Cl.[4] C07D *235/30, 235/32*

U.S. Cl. 548—306 11 Claims

1. A process for the preparation of a compound of the formula (IX)



(IX)

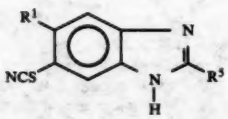
wherein

R^1 is hydrogen, halogen, C_{1-4} alkyl, C_{1-3} alkoxy, or trifluoromethyl;

R^5 is amino or C_{1-4} alkoxycarbonylamino; and

$R^{4'}$ is a lone pair of electrons, in which case an alkali metal or alkali earth metal cation forms a salt with the sulfur atom, or $R^{4'}$ is hydrogen, or a salt thereof, which comprises the steps of:

(a) reacting a compound of the formula (VIII)



(VIII)

or a salt thereof, with an alkali or alkali earth metal sulfide to yield a salt of the formula (IX) wherein $R^{4'}$ is a lone pair of electrons, and in the case where compounds of the formula (IX) where $R^{4'}$ is hydrogen are to be produced;

(b) acidifying the salt of the formula (IX), prepared during step (a) to yield the desired product.

4,599,429

DESTRUCTION OF DNPI IN AN ALL NITRIC ACID NITRATION PROCESS

Roy R. Odle, Schuylerville, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 8, 1983, Ser. No. 559,574

Int. Cl.[4] C07D *209/48*

U.S. Cl. 548—481 22 Claims

1. A means of decomposing undesirable by-products formed during the nitration by nitric acid only of N-C_1 to C_8 alkyl phthalimides, said means comprising elevating the temperature of the reaction mix after the onset of nitration or following nitration to at least about 40° C. and maintaining said elevated temperature until nitration is complete and/or substantially all by-product is decomposed.

4,599,430

NITROGENATION OF HYDROCARBONS, INCLUDING THE PRODUCTION OF MALEIMIDE

Ernest C. Milberger, Solon, and Eunice K. T. Wong, Cleveland, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 332,623, Dec. 21, 1981, abandoned. This application Feb. 2, 1984, Ser. No. 576,294

Int. Cl.[4] C07D *207/24*

U.S. Cl. 548—548 14 Claims

1. A process for the direct synthesis of maleimide which does not proceed through maleic anhydride as a intermediate, the process comprising contacting in the vapor phase an unsaturated hydrocarbon having from 4 to about 9 carbon atoms with ammonia and molecular oxygen or a molecular oxygen-containing gas in the presence of an oxidation catalyst having variable valency metal oxides; and recovering said maleimide.

4,599,431

PROCESS FOR THE PREPARATION OF NAPHTHALENE-1,4,5,8-TETRACARBOXYLIC ACID AND ITS 1,8-MONOANHYDRIDE IN A HIGH DEGREE OF PURITY

Siegfried Schiessler, Bad Soden am Taunus, and Ernst Spietschka, Idstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 5, 1984, Ser. No. 627,776

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1983, 3324881

Int. Cl.[4] C07D *311/80*

U.S. Cl. 549—232 8 Claims

1. A process for the preparation of naphthalene-1,4,5,8-tetracarboxylic acid (called "NTC" below) and its 1,8-monoanhydride in a high degree of purity, which comprises dissolving impure NTC or impure NTC-1,8-monoanhydride (the impurities contained in the said two starting materials originating from their preparation from pyrene) in water under the addition of at least the stoichiometric amount of alkali metal hydroxide as the tetra-alkali metal salt of NTC in water, removing any insoluble impurities present, bringing the clarified solution to a pH value of 4–5 below 45° C., separating off the di-alkali metal salt of NTC which thereby crystallizes out and converting the latter into free NTC or free NTC-1,8-monoanhydride by treatment with a strong acid at 20° to 100° C.

7. The disodium salt of naphthalene tetracarboxylic acid, which has an X-ray diffraction spectrum with reflexes at diffraction angles (2θ, Cu-K_α) of 9.50; 12.85; 14.50; 16.10; 17.25; 20.15; 26.40; 27.60; 28.05; 29.45 and 31.10°.

8. The dipotassium salt of naphthalene tetracarboxylic acid, which has an X-ray diffraction spectrum with reflexes at diffraction angles (2θ, Cu-K_α) of 9.40; 10.90; 13.70; 16.30; 17.90; 19.55; 20.90; 23.35; 26.00; 27.10; 27.75; 29.75 and 30.55°.

4,599,432

PROCESS FOR PREPARING A COMPOSITION CONTAINING AN ALKENYL SUCCINIC ANHYDRIDE

Katsuhiko Kuroda, Yokohama, and Hideki Yamanouchi, Machida, both of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Nov. 7, 1984, Ser. No. 669,081

Claims priority, application Japan, Nov. 25, 1983, 58-221820

Int. Cl.[4] C07D *307/60*

U.S. Cl. 549—255 13 Claims

1. A process for preparing a composition containing an alkenyl succinic anhydride, which comprises:

heating maleic anhydride and an olefin to effect a thermal addition reaction between the reactants; and further

adding a perioxide to cause unreacted olefin and unreacted maleic anhydride to undergo a radical initiated reaction.

4,599,433

REACTION OF OLEFINS WITH MALEIC ANHYDRIDE

Klaus Bronstert, Carlsberg; Hans-Henning Vogel, Frankenthal, and Hans P. Rath, Gruenstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 28, 1985, Ser. No. 717,109

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1984, 3411531

Int. Cl.[4] C07D *307/60*

U.S. Cl. 549—255 3 Claims

1. A process for the reaction of an olefinically unsaturated hydrocarbon, which has a mean number average molecular weight M_n of from 100 to 3000, with maleic anhydride in a molar ratio of maleic anhydride to olefin of from 0.2 to 3.0, in the presence of from 1 to 5000 ppm by weight, based on the olefin, of an additive which prevents side reactions, at from 150° to 280° C., with formation of the corresponding succinic anhydride wherein the additive used is an alkoxide of titanium, of zirconium, of vanadium or of aluminum.

4,599,434

CYCLOPENTANONE DERIVATIVES

Elden H. Banitt, Woodbury, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Division of Ser. No. 551,965, Nov. 15, 1983, Pat. No. 4,497,954. This application Nov. 19, 1984, Ser. No. 674,233

Int. Cl.[4] C07D *317/72*

U.S. Cl. 549—342 1 Claim

1. 5-benzyloxy-N-[(2-oxocyclopentane)methyl ethylene ketal]-2-(2,2,2-trifluoroethoxy)benzamide.

4,599,435

PREPARATION OF 6-CARBOXY-3,4-DIHYDRO-2H-PYRAN

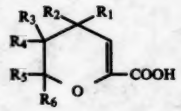
Joachim W. Wolfram, and John Y. Lee, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 544,399, Oct. 21, 1983, abandoned, which is a continuation-in-part of Ser. No. 419,758, Sep. 20, 1982, abandoned. This application Mar. 25, 1985, Ser. No. 715,768

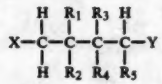
Int. Cl.[4] C07D *309/22*

U.S. Cl. 549—425 21 Claims

1. A process for preparing 6-carboxy-3,4-dihydro-2H-pyrans corresponding to the formula:



wherein R_1, R_2, R_3, R_4 and R_5 are the same or different and are hydrogen or linear or branched alkyl, aralkyl or aryl radicals having up to 20 carbon atoms and R_6 is hydrogen which comprises reacting 1,4-disubstituted butane having leaving groups selected from halo, sulfonate, and tertiary amines at the one and four positions corresponding to the formula:



wherein R_1, R_2, R_3, R_4 and R_5 are as defined above and X and Y are leaving groups which can be the same or different in a liquid solvent medium with carbon monoxide at elevated temperature and pressure in the presence of a catalytic amount of a metal carbonyl compound and an alkali metal inorganic base or an alkaline earth metal inorganic base.

4,599,436

FORMS OF AUROTHIOMALATE HAVING THERAPEUTIC ADVANTAGE

Debra A. Harvey, Hamilton; Walter F. Kean, Dundas, and Colin J. L. Lock, Burlington, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Mar. 28, 1983, Ser. No. 479,746

Int. Cl.[4] C07F *1/12*

U.S. Cl. 556—114 5 Claims

1. A pure colourless form of sodium aurothiomalate having the following characteristics:

an optical density below about 0.3 throughout the visible light range of 350 to 450 nm when in aqueous solution at a concentration of about 12.5 mg/ml,

lack of platelet toxicity as measured by platelet aggregation and concomitant serotonin release,

inability to provoke the appearance of gold-containing particles within platelets on treatment thereof with the said colourless form of sodium aurothiomalate, in amounts which, for the coloured form of sodium aurothiomalate, do cause the appearance of gold-containing particles.

4,599,437

CONTINUOUS PROCESS FOR VARYING MOLECULAR WEIGHT OF ORGANOPOLYSILOXANES

Manfred Riederer, Burghausen, Fed. Rep. of Germany, assignor to Wacker-Chemie GmbH, Fed. Rep. of Germany

Filed Aug. 19, 1985, Ser. No. 767,157

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1984, 3439543

Int. Cl.[4] C07F *7/08*

U.S. Cl. 556—462 5 Claims

1. In a process for varying the molecular weight of linear or cyclic organopolysiloxanes in the presence of a catalyst which is solid in the reaction mixture at the reaction temperature, the improvement comprising that the catalyst which is solid in the reaction mixture at least at the respective reaction temperature and the organopolysiloxane whose molecular weight is to be changed are continuously and simultaneously passed through a heated cylindrical reactor whose contents is mechanically moved, the reactor having a length to inside diameter ratio of 1:1 to 20:1 and its interior pressure being held at 50 to 500 hPa (abs.) and the catalyst is removed from the mixture after leaving the reactor.

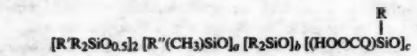
4,599,438

ORGANOSILOXANE POLYMERS AND TREATMENT OF FIBRES THEREWITH

James W. White; Stephen Westall, both of Barry, and Brian J. Griffiths, Coytrahen, all of Wales, assignors to Dow Corning, Ltd., Barry, Wales

Filed Oct. 31, 1983, Ser. No. 546,793
Claims priority, application United Kingdom, Nov. 16, 1982, 8232646
Int. Cl.[4] C07F 7/08, 7/18
U.S. Cl. 556—439 3 Claims

1. Organosiloxanes represented by the general formula



$$[R'R_2SiO_{0.5}]_2\,[R''(CH_3)SiO]_a\,[R_2SiO]_b\,[(HOOCQ)SiO]_c$$

wherein Q represents a divalent group attached to silicon through a silicon to carbon bond and selected from hydrocarbon groups, groups composed of carbon, hydrogen and oxygen and groups composed of carbon, hydrogen and sulphur, each R represents a monovalent hydrocarbon group having less than 19 carbon atoms, at least 50 percent of the total R groups being methyl, each R' represents a hydrogen atom, an alkoxy or alkoxyalkoxy group having less than 7 carbon atoms, a monovalent hydrocarbon group having less than 19 carbon atoms or the group —QCOOH, except that R' may not represent a monovalent hydrocarbon group or the group —QCOOH when a is 0, R'' represents a hydrogen atom or an alkoxy or alkoxyalkoxy group having less than 7 carbon atoms, a is 0 or an integer, b is 0 or an integer and c is an integer having a value up to a+b+c+2/3, there being present in the molecule at least two silicon-bonded substituents selected from the hydrogen atom, alkoxy groups having less than 7 carbon atoms and alkoxyalkoxy groups having less than 7 carbon atoms.

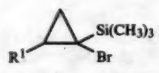
4,599,439

ARACHIDONIC ACID ANALOGS

Raj N. Misra, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 6, 1984, Ser. No. 638,335
Int. Cl.[4] C07F 7/08, 7/18
U.S. Cl. 556—443 4 Claims

1. A compound of the structure



wherein R^1 is $-(CH_2)_q-CH=CH_2$ wherein q is 0 or 2, $(CH_2)_p-OR$ wherein p is 2 or 3, and R^2 is H or $Si(C_6H_5)_2-C-(CH_3)_3$.

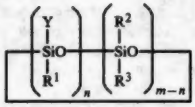
4,599,440

ORGANOCYCLOSILOXANE

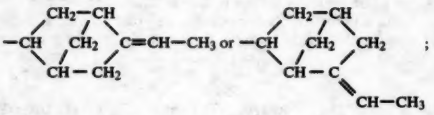
Junichiro Watanabe, and Yuichi Funahashi, both of Ohta, Japan, assignors to Toshiba Silicone Co., Ltd., Japan

Filed Aug. 30, 1985, Ser. No. 771,372
Claims priority, application Japan, Sep. 26, 1984, 59-201179
Int. Cl.[4] C07F 7/08
U.S. Cl. 556—460 3 Claims

1. An organocyclosiloxane comprising a compound having the following formula:



wherein R^1, R^2 and R^3, which may be the same or different, represent a hydrogen atom or a monovalent hydrocarbon group having 1 to 8 carbon atoms; Y represents



m is an integer 3 to 5 and n is an integer of 1 to m.

4,599,441

PROCESS FOR PREPARING ORGANOHALOSILANES UTILIZING COPPER HALIDE-ALUMINUM HALIDE CATALYSTS

Bernard Kanner, West Nyack, and Kenrick M. Lewis, Rego Park, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1985, Ser. No. 781,458
Int. Cl.[4] C07F 7/08, 7/12
U.S. Cl. 556—469 26 Claims

1. A process for effecting the redistribution of at least one organic group bonded to a silicon atom by a silicon to carbon bond and at least one halogen atom bonded to a silicon atom which process comprises:

(1) forming a reaction mixture of

(a) a first silane or first mixture of silanes containing at least one organic group bonded to a silicon atom by a silicon to carbon bond and at least one halogen atom bonded to a silicon atom;

(b) a catalytic amount of a complex of AlX_3 and CuX_n wherein n is 1 or 2 and X is a halogen atom; and

(2) maintaining such mixture at a temperature and pressure at which said group and atom in (1)(a) redistribute to form a second silane or a second mixture of silanes different from said silane or said first mixture of silanes.

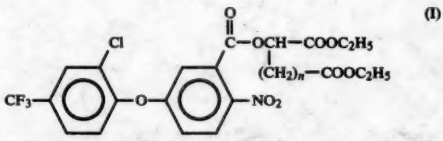
4,599,442

(BISALKOXYCARBONYL)ALKYL 5-[2-CHLORO-4-(TRIFLUOROMETHYL)PHENOXY]-2-NITROBENZOATES

Robert J. Theissen, Bridgewater, N.J., assignor to Rhone-Poulenc, Inc., Monmouth Junction, N.J.

Continuation-in-part of Ser. No. 274,105, Jun. 16, 1981, which is a continuation-in-part of Ser. No. 117,753, Feb. 1, 1980, abandoned. This application Jul. 10, 1981, Ser. No. 282,203
Int. Cl.[4] C07C 79/46
U.S. Cl. 560—21 3 Claims

1. A herbicidal compound of the formula



(I)

where n is zero or one.

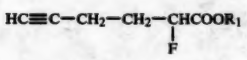
4,599,443

UNSATURATED EICOSANOIC ACIDS

Ka-Kong Chan, Hopatcong; George W. Holland, and Perry Rosen, both of North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 383,445, Jun. 1, 1982, Pat. No. 4,500,462, which is a division of Ser. No. 278,531, Jun. 29, 1981, Pat. No. 4,345,084. This application Oct. 31, 1984, Ser. No. 666,782
Int. Cl.[4] C07C 69/62, 57/18
U.S. Cl. 560—219 1 Claim

1. A compound of the formula



where R_1 is hydrogen, lower alkyl, alkaline earth metal or alkali metal; or magnesium halide salts thereof.

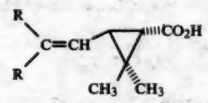
4,599,444

PROCESS FOR THE SEPARATION OF ISOMERIC CYCLOPROPANE-CARBOXYLIC ACIDS

Elemér Foggassy; Ferenc Faigl; Rudolf Soós, and József Rákóczi, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed Feb. 17, 1984, Ser. No. 581,081
Claims priority, application Hungary, Feb. 17, 1983, 551/83
Int. Cl.[4] C07B 57/00
U.S. Cl. 562—401 19 Claims

1. A process for preparing the optically active cis and trans isomers of the cyclopropanecarboxylic acids of the formula



(I)

wherein

R stands for a methyl group or a halogen atom, which comprises,

reacting a salt formed with an alkali hydroxide or an alkali carbonate of dl-cis-trans-2,2-dimethyl-3-(2,2-disubstituted vinyl)-cyclopropanecarboxylic acids containing the isomers in any ratio or the pure dl-cis and dl-trans-2,2-dimethyl-3-(2,2-disubstituted vinyl)-cyclopropanecarboxylic acids prepared therefrom by the means of a selective dissolution with aromatic and aliphatic hydrocarbon solvents with N-benzyl-2-aminobutanol enantiomers or with the hydrochlorides thereof in an aqueous medium or aqueous acetone medium obtaining the crystalline diastereomeric salt from the solution by filtration, decomposing said salt by using a mineral acid, then separating the thus obtained optically active cyclopropanecarboxylic acid.

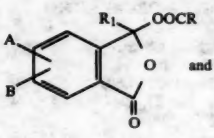
4,599,445

PROCESS FOR BENZOPHENONE TETRACARBOXYLIC ACID

Visweswara R. Durvasula, Cheshire, assignor to The Dow Chemical Company, Midland, Mich.

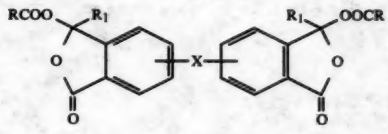
Division of Ser. No. 460,177, Jan. 24, 1983, Pat. No. 4,485,247. This application Sep. 21, 1984, Ser. No. 652,922
Int. Cl.[4] C07C 51/09; C07D 307/88
U.S. Cl. 562—419 10 Claims

1. A method for converting a 3-alkanolyloxyphthalide selected from the formulae consisting of



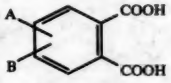
and

I



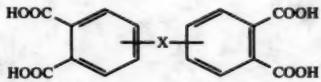
II

to the corresponding polycarboxylic acids having the formulae



and

III



IV

wherein R represents lower-alkyl, R_1 is selected from the group consisting of hydrogen and linear lower-alkyl, A and B taken separately are independently selected from the group consisting of hydrogen and any substituent that does not react with the carboxylic acid products or phthalides or otherwise interfere with the oxidation, A and B taken together represent an aromatic nucleus fused to the phenyl ring, and X is selected from the group consisting of —CO—, —SO_2—, —O—, and a single bond, said method comprising oxidizing said 3-alkanoyloxyphthalide with aqueous alkaline hypohalite.

4,599,446

PROCESS FOR THE PREPARATION OF 2-KETO-L-GULONIC ACID

Tadamitsu Kiyoura, Kamakura, Japan, assignor to Mitsui Toatsu Chemicals, Incorporated, Japan

Continuation of Ser. No. 539,737, Oct. 6, 1983, abandoned. This application Apr. 17, 1985, Ser. No. 723,800
Int. Cl.[4] C07C 51/235, 59/215
U.S. Cl. 562—527 8 Claims

1. A process for the preparation of 2-keto-L-gulonic acid which comprises oxidizing L-sorbose with an oxygen-containing gas in water used as the solvent and in the presence of a carrier supported catalyst containing, based on the weight of the carrier, 1–10% of platinum and/or palladium and 0.5–8% of lead or bismuth, the reaction being carried out with the pH of the reaction fluid kept within the range of 6 to 8.

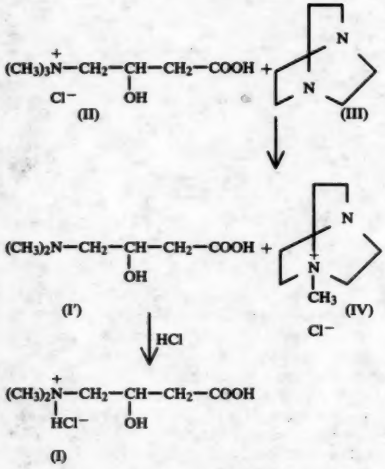
4,599,447

PROCESS FOR PREPARING L-NORCARNITINE HYDROCHLORIDE

Maria O. Tinti, Rome, Italy, assignor to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

Filed Jun. 28, 1985, Ser. No. 750,689
Claims priority, application Italy, Jul. 27, 1984, 48660 A/84
Int. Cl.[4] C07C *101/30*
U.S. Cl. 562—567 2 Claims

1. Process for producing L-norcarnitine hydrochloride according to the following reaction scheme



comprising the steps of:

(a) reacting a mixture of L-carnitine chloride (II) and 1,4-diazabicyclo[2,2,2]octane (III) in molar ratio 1:2–1:6 in a high boiling organic solvent, inert to the reaction, at the reflux temperature of the mixture, for about 2–48 hours, thereby obtaining a reaction mixture comprising L-norcarnitine (I'), the N-methyl derivative (IV) of the 1,4 diazabicyclo[2,2,2]octane as side-product, the unreacted excess of (III) and some unreacted (II), if any;

(b) cooling the reaction mixture of step (a) to 4°–10° C. thereby precipitating at least part of the unreacted 1,4 diazabicyclo[2,2,2]octane (III) and of the N-methyl derivative (IV), and filtering off the precipitate;

(c) distilling under vacuum the filtrate of step (b) in order to remove the high boiling solvent, taking up the residue with water, thereby obtaining an aqueous solution;

(d) eluting the solution of the step (c) on a strongly basic ion-exchange resin activated in the OH^- form, thereby separating L-norcarnitine (I) which remains on the resin from an eluate comprising the remaining 1,4 diazabicyclo[2,2,2]octane (III), its N-methyl derivative (IV) and the unreacted (II), if any; and

(e) eluting the resin of step (d) with 1N–2N hydrochloric acid, thereby obtaining a solution of L-norcarnitine hydrochloride (I).

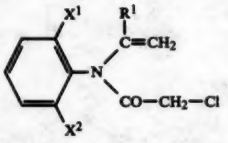
4,599,448

NOVEL N-(1-ALKENYL)-CHLOROACETANILIDES AS HERBICIDES AND PLANT GROWTH REGULATORS

Rudolf Thomas, Wuppertal; Ludwig Eue, Leverkusen; Robert Schmidt, and Klaus Lürssen, both of Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 375,062, May 5, 1982, abandoned. This application Feb. 13, 1984, Ser. No. 579,834
Claims priority, application Fed. Rep. of Germany, May 26, 1981, 3120990
Int. Cl.[4] C07C *103/34*
U.S. Cl. 564—214 12 Claims

1. An N-(alkenyl)-chloroacetanilide of the formula



in which

X^1 and X^2 each individually is methyl or ethyl, and

R^1 is hydrogen or methyl.

4,599,449

CATALYTIC ALKYLATION OF AROMATIC AMINES WITH ALKANOLS

Duane C. Hargis, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jun. 25, 1984, Ser. No. 624,522
Int. Cl.[4] C07C *85/24*
U.S. Cl. 564—409 16 Claims

1. A process for alkylating aromatic amines comprising the step of reacting (a) an aromatic amine having at least one replaceable hydrogen atom on an amine group or on an aromatic ring carrying an amino group or both, with (b) an alkanol in the presence of a metal oxide alkylation catalyst consisting essentially of at least 70 mole % of Group VII-B metal oxide and no more than about 30 mole % of Group VIII metal oxide so that alkylation of the aromatic amine occurs and so that at least a substantial portion of the alkanol not consumed in the alkylation reaction passes through the alkylation zone undecomposed.

4,599,450

PROCESS FOR THE PREPARATION OF ACID NITRO DYESTUFFS

Hasso Hertel, Mühlheim am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed May 10, 1984, Ser. No. 608,990
Claims priority, application Fed. Rep. of Germany, May 13, 1983, 3317471
Int. Cl.[4] C07C *87/50*
U.S. Cl. 564—433 20 Claims

1. A process for the preparation of acid nitro dyestuffs by treating an aminonitrodiphenylaminesulfonic acid with an oxidizing agent in an aqueous medium, wherein the oxidizing agent employed is a manganese-(VI) or manganese-(VII) compound, and the reaction is carried out at a pH higher than 5 and at a temperature between 20° and 100° C.

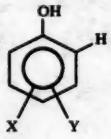
4,599,451

PROCESS FOR PREPARING ORTHO-(ALKYLTHIO)PHENOLS

Paul W. Wojtkowski, Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed May 31, 1985, Ser. No. 740,030
Int. Cl.[4] C07C *149/36*
U.S. Cl. 568—54 21 Claims

1. A process for the preparation of ortho-(alkylthio)phenols comprising reacting a phenol of the formula:



wherein

X and Y are independently H, OH, C_1–C_6 alkyl, OR_1, SR_1, Cl, F, I, Br or aryl substituted with C_1–C_6 alkyl, OR_1, SR_1, Cl, F, I or Br, or when X and Y are on adjacent carbon atoms, they may be taken together to form CH=CH—CH=CH; and

R_1 is C_1–C_6 alkyl; provided that X and Y cannot simultaneously be OH;

with a dialkyl disulfide of the formula, $(RS)_2$

wherein R is C_1–C_6 alkyl;

provided that when R is C_4–C_6 alkyl, the carbon bonded to the heteroatom must be substituted by one or two hydrogen atoms;

at a temperature of 100°–300° C. and at atmospheric pressure in the presence of a zirconium phenoxide catalyst with the continual removal of mercaptan by-product, said phenol and disulfide being in a molar ratio of 3:1–1:3 of phenol to disulfide and the catalyst and disulfide being in a molar ratio of 0.99:1–0.01:1 of catalyst to disulfide.

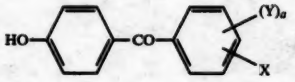
4,599,452

CHEMICAL PROCESS

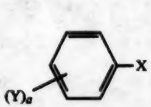
Howard M. Colquhoun, Knutsford, and Alan G. Breeze, Northwich, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jun. 4, 1984, Ser. No. 616,894
Claims priority, application United Kingdom, Jun. 7, 1983, 8315612
Int. Cl.[4] C07C *45/46*
U.S. Cl. 568—319 11 Claims

1. A process for the preparation of a 4-hydroxybenzophenone having the formula



which comprises reacting a poly(4-oxybenzoyl) with an aromatic compound of the formula



in the presence of an effective amount of an acid catalyst, wherein

X represents hydrogen or a substituent that is not strongly electron-attracting;

Y is a substituent which is not strongly electron-attracting; and

a is zero or an integer of 1 to 4,

the remaining substituents being hydrogen atoms and the overall effect of X and the substituents Y is not sufficient to deactivate the aromatic compound to such an extent that substitution occurs only with difficulty.

4,599,453

PROCESS FOR THE SINGLE-STAGE PRODUCTION OF HIGHER ALIPHATIC KETONES

Carlo Fragale; Michele Gargano, and Michele Rossi, all of Bari, Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

Filed Feb. 25, 1985, Ser. No. 705,010
Int. Cl.[4] C07C *45/49*
U.S. Cl. 568—387 9 Claims

1. A single stage process for the production of a higher aliphatic ketone starting from a ketone of lower molecular weight, which comprises reacting a ketone of lower molecular weight with carbon monoxide at temperatures between 120° C. and 220° C. at a carbon monoxide partial pressure between 0.5 and 80 bars and in the presence of a catalyst consisting of copper supported on aluminum oxide, said catalyst being obtained by hydrolyzing an aqueous solution of a cuproammonium complex containing aluminum oxide to form a copper-containing precipitate on the aluminum oxide, calcining said copper-containing precipitate on aluminum oxide, and then heating the said calcined copper-containing precipitate on aluminum oxide with hydrogen at a temperature between 100° and 350° C.

4,599,454

SYNTHESIS OF KETONES FROM ALCOHOLS

David J. Elliott, and Filippo Pennella, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 22, 1985, Ser. No. 725,844
Int. Cl.[4] C07C *45/49*
U.S. Cl. 568—387 23 Claims

1. A process for preparing ketones which comprises the step of contacting a mixture comprising

(a) at least one alcohol selected from the group consisting of normal primary alcohols having from 2 to 6 carbon atoms per molecule, and

(b) carbon monoxide

with a catalyst composition comprising copper(II) oxide and zinc oxide, under such conditions as to produce a reaction product comprising at least one ketone having at least 1 carbon atoms per molecule more than said at least one alcohol.

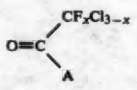
4,599,455

PROCESS OF PURIFYING FLUORINATED CARBONYL COMPOUND MIXED WITH HYDROGEN FLUORIDE

Yutaka Maruyama, No. 1-6-8, Minami-dai, Kamifukuoka City; Junji Negishi, No. 1-10-24, Suna-shinden, Kawagoe City; Katuyoshi Murata, No. 1-6-8, Minami-dai, Kamifukuoka City, and Yutaka Katsuhara, No. 4-18-7, Suna-shinden, Kawagoe City, all of Japan

Filed Apr. 27, 1984, Ser. No. 604,534
Claims priority, application Japan, Apr. 30, 1983, 58-74925
Int. Cl.[4] C07C *45/78;* B01D *53/14*
U.S. Cl. 568—411 5 Claims

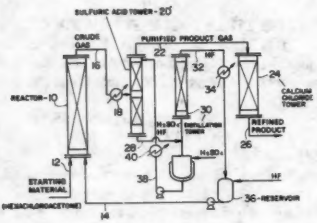
1. A process of purifying a fluorinated carbonyl compound which is expressed by the general formula



where x is 2 or 3 and A represents CF_3 or H, and coexists with hydrogen fluoride in a mixed gas, the process comprising the steps of:

(a) adjusting the temperature of said mixed gas so as to remain in the range from 100° to 300° C.;

(b) bringing said mixed gas of which the temperature is in said range into contact with concentrated sulfuric acid of



which the temperature is maintained in the range from 10° to 40° C. to allow said sulfuric acid to absorb substantially the entire amount of hydrogen fluoride contained in said mixed gas;

(c) recovering the unabsorbed portion of said mixed gas; and

(d) recovering hydrogen fluoride absorbed in said sulfuric acid.

4,599,456

NOVEL ALDEHYDE-PHOSPHINE COMPOSITIONS AND USES THEREFOR

Charles A. Drake, Nowata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 20, 1984, Ser. No. 684,210
Int. Cl.[4] C07C *47/058*
U.S. Cl. 568—421 **18 Claims**

1. A novel composition of matter consisting essentially of:

(i) an aldehyde having the structure

R—CHO

wherein R is a C_8–C_{30} carbon radical, and

(ii) 0.1–5 parts by weight of triarylphosphine per 100 parts of aldehyde, wherein the triarylphosphine has the structure:

$(Ar)_3P$

wherein each Ar is independently a C_6–C_{12} aryl or alkyl-substituted aryl group.

4,599,457

PROCESS OF PREPARING HYDROXYARYLALDEHYDES

Phillip L. Mattison, New Brighton, and LeRoy Krbechek, Golden Valley, both of Minn., assignors to Henkel Corporation, Minneapolis, Minn.

Filed Mar. 20, 1985, Ser. No. 714,149
Int. Cl.[4] C07C *45/45*
U.S. Cl. 568—433 **14 Claims**

1. In a process of preparing a hydroxyarylaldehyde wherein a phenolic compound is reacted with formaldehyde in the presence of a catalyst, the improvement wherein the reaction is conducted in the presence of a yield effective amount of a hydroxylamine modifier having the formula:

where R_1 is selected from the group consisting of: an alkyl group having from 1 to 12 carbon atoms, a cycloalkyl group that can have 5 and 6 carbon atoms, and an H, and where R_2 is selected from the group consisting of: an alkyl group having from 1 to 12 carbon atoms, and a cyclo alkyl group that can have 5 and 6 carbon atoms; and where R_1 and R_2 can together form a cyclic group that can have 5 and 6 carbon atoms

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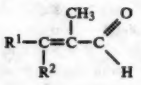
4,599,458

PREPARATION OF 2-METHYLALK-2-ENALS

Rolf Fischer, Heidelberg; Wolfgang Hoelderich, Frankenthal; Franz Merger, Frankenthal; Wolf D. Mross, Frankenthal, and Hans-Martin Weitz, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

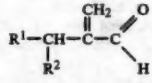
Filed Jun. 7, 1985, Ser. No. 742,200
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1984, 3421809
Int. Cl.[4] C07C *45/61*
U.S. Cl. 568—450 **7 Claims**

1. A process for the preparation of a 2-methylalk-2-enal of the formula


I

where R^1 and R^2 are each hydrogen, alkyl of 1 to 18 carbon atoms, phenyl or phenyl substituted by alkyl, alkoxy or halogen, which process comprises:

bringing an acrolein derivative of the formula


II

where R^1 and R^2 have the above meanings, into contact with at least one catalyst selected from the group consisting of a zeolite, an aluminum silicate and an aluminum phosphate at from 30° to 500° C.

4,599,459

METHOD FOR THE ULTRASONIC TREATMENT OF A DILUTE ALCOHOLIC SOLUTION

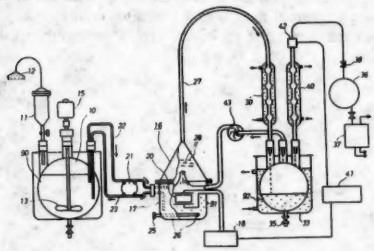
Masanao Hirose, 2-9-93, Koda, Adachi-ku, Tokyo-to, Japan

Filed Aug. 31, 1984, Ser. No. 646,062
Int. Cl.[4] C07C *45/29, 27/26, 29/74*
U.S. Cl. 568—471 **5 Claims**

1. A method for the ultrasonic treatment of a dilute alcoholic solution which comprises placing a vibrator member in a dilute alcoholic solution, and subjecting the vibrator member to ultrasonic vibrations to cause cavitation in the solution whereby the alcohol in the solution is vaporized; wherein said alcohol is a lower aliphatic alcohol or a mixture thereof.

4. The method of claim 1, wherein the vaporized alcohol is

converted into a corresponding aldehyde by introducing a gaseous oxygen-containing gas into the solution to oxidize the



vaporized alcohol with the oxygen, and condensing and liquefying the resulting aldehyde.

4,599,460

POLYALKYLENE ETHER GLYCOL COPOLYMERS

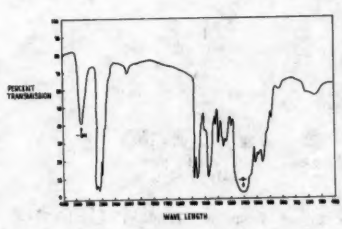
Yuzo Toga; Ichiro Okamoto, and Tatsuya Kanno, all of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 511,380, Jul. 6, 1983, abandoned. This application Aug. 13, 1985, Ser. No. 765,563

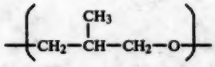
Claims priority, application Japan, Apr. 13, 1983, 58-64801

Int. Cl.⁴ C07C *41/01, 43/10*

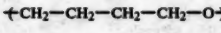
U.S. Cl. 568—617 **10 Claims**



1. Polyalkylene ether glycol copolymer having a number-average molecular weight of 500 to 10,000 and having hydroxyl groups at both ends of the molecule, said copolymer consisting essentially of recurring structural units of the following formulae (I) and (II) in a molar ratio of from 1/99 to 99/1:



(I)



(II)

4,599,461

PROCESS FOR THE SYNTHESIS OF O-ISOPROPOXYPHENOL

Paolo Maggioni, Montevecchia; Francesco Minisci, Milan, and Mariano Correale, Bonate Sotto, all of Italy, assignors to Brichima Spa, Milano, Italy

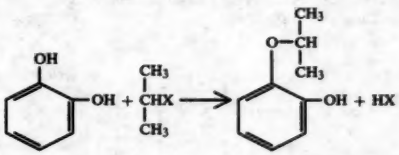
Filed Jan. 10, 1985, Ser. No. 690,120

Claims priority, application Italy, Jan. 20, 1984, 19249 A/84

Int. Cl.⁴ C07C *41/16*

U.S. Cl. 568—652 **2 Claims**

1. A process for preparing o-isopropoxyphenol (I) by means of the reaction:



II III I

in which X is a halogen atom, in a reaction medium constituted by a mixture of organic solvents, of pytrocatechol (II) with an isopropyl halide (III), in the presence of an alkaline base in the solid state and of a solid-liquid phase transfer catalyst comprising a quaternary ammonium salt of general formula:

in which R_1, R_2, R_3 and R_4 are equal or different unsubstituted or substituted hydrocarbon groups containing between 1 and 18 carbon atoms, Q is nitrogen or phosphorus and X^- is a monovalent anion, and wherein:

(a) the alkaline base is sodium or potassium carbonate or sodium or potassium hydroxide;

(b) said mixture of organic solvents comprises one solvent which is a low boiling alcohol, and one which is a high-boiling hydrocarbon;

(c) the molar ratio of pyrocatechol to isopropyl halide is between 0.8 and 1.6;

(d) the molar ratio of pyrocatechol to alkaline base lies between 2.5 and 0.5;

(e) the quantity of catalyst used lies between 0.01 and 0.5 moles per equivalent of alkaline base; and

(f) the reaction is conducted in a nitrogen atmosphere, at atmospheric pressure, under agitation, at a temperature between 50° and 130° C.

4,599,462

METHODS FOR MAKING SOLID SOLUTIONS FROM NORMALLY IMMISCIBLE COMPONENTS AND FOR MODIFYING THE SURFACE STRUCTURE OF SOLID MATERIALS

Josef Michl, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Filed May 25, 1983, Ser. No. 497,789

Int. Cl.⁴ C07C *37/88, 37/68*

U.S. Cl. 568—702 **40 Claims**

1. A method of making composites from chemical components which are not appreciably miscible under equilibrium conditions, the method comprising the steps of:

providing a cold substrate;

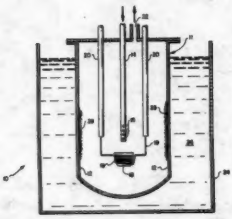
generating a vapor of a host component which is generally a solid at temperatures of at least as high as about −40° C.;

generating a vapor of a guest component which is not appreciably miscible with the host component under equilibrium conditions; and

codepositing the host component vapor and the guest component vapor on the cold substrate such that the guest component is incorporated into the host component in concentrations greater than those present under equilibrium conditions, the host component and the guest component condensing on the cold substrate to form a composite which is stable at temperatures of at least as high as about −40° C.

40. A method of making composites from chemical components which are not appreciably miscible under equilibrium conditions, the method comprising the steps of:

providing a cold substrate;



generating a vapor of a host component which is generally a solid at temperatures of at least as high as about −40° C.;

generating a vapor of an organic guest component which is not appreciably miscible with the host component under equilibrium conditions, the organic guest component being a phenol or a substituted phenol; and

codepositing the host component vapor and the organic guest component vapor on the cold substrate such that the organic guest component is incorporated into the host component is concentrations greater than those present under equilibrium conditions, the host component and the organic guest component condensing on the cold substrate to form a composite which is stable at temperatures of at least as high as about −40° C.

4,599,463

PROCESS FOR THE PREPARATION OF BISPHENOLS

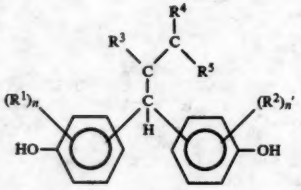
Victor Mark, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 24, 1984, Ser. No. 685,904

Int. Cl.⁴ C07C *39/16*

U.S. Cl. 568—723 **21 Claims**

1. A process for the preparation of a bisphenol of the formula (I)



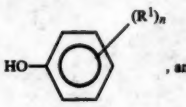
wherein:

R^1 and R^2 are independently selected from monovalent hydrocarbon and monovalent hydrocarbonoxy radicals of one to four carbon atoms, or from halogen radicals; and

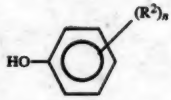
R^3, R^4 and R^5 are independently selected from a lower alkyl radical of one to eight carbon atoms, an aryl radical of six to twelve carbon atoms, an alkaryl radical of seven to fourteen carbon atoms and a cycloalkyl radical of from three to eight ring carbon atoms, and R^5 may also be hydrogen;

n and n' are independently selected from whole numbers having a value of from 0 to 4 inclusive, comprising:

a step of reacting a phenol selected from the group consisting of:



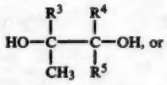
(II)



(III)

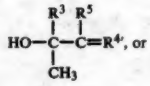
with a difunctional agent selected from the group consisting of:

a vicinal glycol of the formula (IV)

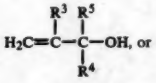


(IV)

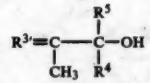
an unsaturated alcohol of the formulae (VA), (VB), or (VC)



(VA)

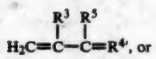


(VB)

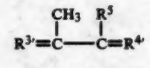


(VC)

a diene selected from the formulae (VI and VII)



(VI)



(VII)

wherein the divalent hydrocarbon radicals represented by $R^{3'}$ and $R^{4'}$ are lower alkylidene, aralkylidene and cycloalkylidene radicals,

to form a bisphenol of formula (I).

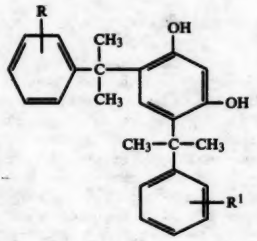
4,599,464

NOVEL COMPOSITIONS

Hans Dressler, Monroeville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Oct. 17, 1985, Ser. No. 788,731
Int. Cl.[4] C07C 39/12
U.S. Cl. 568—766 10 Claims

1. Compositions of the formula:



wherein R and R^1 are the same or different and are selected from the group consisting of hydrogen, methyl, ethyl, propyl and isopropyl.

4,599,465

PROCESS FOR PRODUCING ORTHOALKYLPHENOLS

Akio Tamaru; Yoshiaki Izumisawa, both of Kitakyushu; Hidekichi Hashimoto, Nakama; Kiyoji Kuma; Takashi Komaya, both of Kitakyushu, and Masanobu Minagawa, Nakama, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Jun. 5, 1985, Ser. No. 741,361
Claims priority, application Japan, Jul. 5, 1984, 59-139385
Int. Cl.[4] C07C 39/06, 37/14
U.S. Cl. 568—781 14 Claims

1. A process for synthesizing an o-monoalkylphenol, which comprises:

reacting phenol with a C_2–C_{20} olefin at a temperature of 150°–400° C. in the liquid phase in the presence of an alumina catalyst while maintaining the water content at a level of not higher than 250 ppm.

4,599,466

PREPARATION OF ALKANEDIOLS

Herbert Mueller, Frankenthal, and Wolfgang Reiss, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 11, 1985, Ser. No. 786,614
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1984, 3437429; Dec. 1, 1984, 3443966
Int. Cl.[4] C07C 29/17, 31/20
U.S. Cl. 568—861 7 Claims

1. A process for the preparation of a very pure alkanediol by hydrogenating an alkynediol in an aqueous medium and in the presence of a hydrogenation catalyst under a hydrogen partial pressure of above 20 bar, wherein the hydrogenation is carried out at from 210° to 280° C.

4,599,467

PRODUCTION OF VICINAL ALKYLENE GLYCOLS

Hilde Kersten, Erlenbach, and Gerhard Meyer, Obernburg, both of Fed. Rep. of Germany, assignors to AKZO NV, Arnhem, Netherlands

Continuation of Ser. No. 589,452, Mar. 12, 1984, abandoned, which is a continuation-in-part of Ser. No. 374,609, Apr. 30, 1982, abandoned, which is a continuation of Ser. No. 175,205, Jul. 31, 1980, abandoned. This application Apr. 10, 1985, Ser. No. 722,180
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1979, 2931753
Int. Cl.[4] C07C 29/00, 29/78
U.S. Cl. 568—867 8 Claims

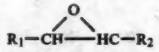
1. A method for producing vicinal alkylene glycols having 10 to 24 carbon atoms which comprises:

contacting in a homogeneous phase at temperatures from about 200° C. to 350° C. and under a carbon dioxide pressure of from about 100 to 300 bar;

water;

a catalyst which is solely a basic catalyst selected from the group consisting of carbonates, bicarbonates, and hydroxides of alkali and alkali earth metals; and

a compound of the Formula (I)



wherein R_1, R_2 and —CH—CH— form together a straight chain with 10 to 24 carbon atoms, R_1 is hydrogen, and R_2 is an alkyl group or R_2 is hydrogen and R_1 is an alkyl group or both R_1 and R_2 are alkyl groups to form a homogeneous phase mixture containing the alkylene glycol.

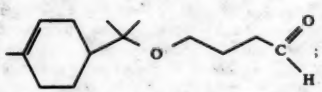
4,599,468

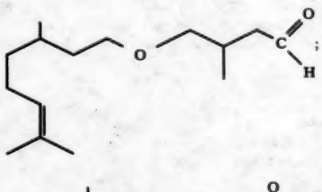
ETHER CARBOXALDEHYDES

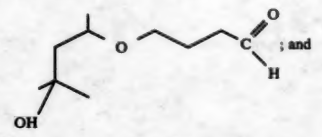
Futoshi Fujioka, Wanamassa; Richard M. Boden, Ocean, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 673,105, Nov. 19, 1984, abandoned, which is a division of Ser. No. 533,915, Sep. 19, 1983, Pat. No. 4,532,364, which is a continuation-in-part of Ser. No. 507,292, Aug. 1, 1983, abandoned. This application Jun. 14, 1985, Ser. No. 744,569
Int. Cl.[4] C07C 47/19, 47/21, 47/32, 45/50
U.S. Cl. 568—420 2 Claims

1. An ether aldehyde compound defined according to a structure selected from the group consisting of:

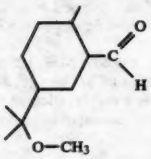

(i)


(ii)


(iii)

-continued

(iv)



4,599,469

HYDROGENATION PROCESS

Ted H. Cymbaluk; Jim D. Byers, and Marvin M. Johnson, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 29, 1984, Ser. No. 614,891
Int. Cl.[4] C07C 21/24
U.S. Cl. 570—193 22 Claims

1. A process for the preparation of a functionally substituted cis-olefinic compound having the formula:

$$H-(CR_2)_x-CH_2-CH=CH-CH_2-(CR_2)_y-CH(-X)_2$$

wherein x=0 through 20, y=1 through 20, each R is independently H, C_1 through C_{20} alkyl, cycloalkyl, aryl, aralkyl and alkaryl, and X is a functional group selected from the group consisting of:

—Cl,
—Br,
—I,
$-CO_2R$,

$$-OC(=O)-R, \text{ and}$$

$$-C(=O)-NR_2;$$

where R is as defined above, said process comprising contacting a functionally-substituted acetylenic compound having the formula:

$$H-(CR_2)_x-CH_2-C\equiv C-CH_2-(CR_2)_y-CH(-X)_2$$

wherein x, y, R and X are as defined above, with hydrogen and a catalyst comprising nickel boride on an inorganic oxide support at a temperature in the range of about 0° to 150° C.; wherein the nickel metal content of said catalyst comprising nickel boride on an inorganic oxide support ranges from about 0.1 to about 40 wt. % based on total weight of support plus nickel boride and calculated as nickel metal; and wherein said inorganic oxide support is selected from the group consisting of:

silica,
alumina,
silica-alumina,
aluminum phosphate,
zirconium phosphate,
titanium phosphate,
calcium phosphate,
magnesium phosphate,
magnesia-titania,
thoria,
titania,
zirconia,
and mixtures of any two or more thereof.

4,599,470

PROCESS FOR THE TRANSALKYLATION OR DEALKYLATION OF ALKYL AROMATIC HYDROCARBONS

Reginald Gregory, Camberley, and David J. Westlake, Woking, both of England, assignors to The British Petroleum Company P.L.C., London, England

Filed Nov. 15, 1983, Ser. No. 551,862
Claims priority, application United Kingdom, Nov. 18, 1982, 8232992
Int. Cl.[4] C07C 5/22
U.S. Cl. 585—323 36 Claims

1. A process for the catalysed transalkylation of alkyl aromatic hydrocarbons wherein the alkyl group is a C_1 to C_{10} alkyl group under transalkylation conditions characterised in that the catalyst is either a cation-exchangeable layered clay or a cation-exchangeable stabilised pillared layered clay.

12. A process for the catalysed transalkylation of an alkyl aromatic hydrocarbon comprising reacting in the liquid phase in an alkylation zone an aromatic hydrocarbon with an alkylating agent selected from C_2 to C_{10} alcohols and olefins under alkylation conditions in the presence as catalyst of a cation-exchangeable layered clay or stabilised pillared layered clay to form a product comprising unreacted aromatic hydrocarbon, monoalkylated aromatic hydrocarbon and polyalkylated aromatic hydrocarbon, recovering at least some of the monoalkylated aromatic hydrocarbon from the product.

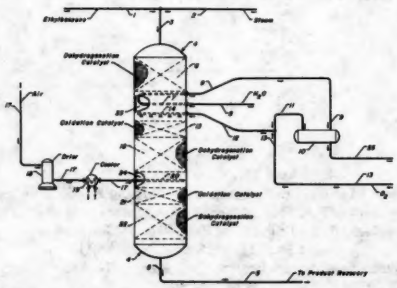
28. A process for the catalysed dealkylation of an alkyl aromatic hydrocarbon comprising reacting in the liquid phase in an alkylation zone an aromatic hydrocarbon with an alkylating agent selected from C_2 to C_{10} alcohols and olefins under alkylation conditions in the presence as catalyst of a cation-exchangeable layered clay or stabilised pillared layered clay to form a product comprising unreacted aromatic hydrocarbon, monoalkylated aromatic hydrocarbon and polyalkylated aromatic hydrocarbon, recovering at least some of the monoalkylated aromatic hydrocarbon from the product.

4,599,471

METHOD FOR OXYGEN ADDITION TO OXIDATIVE REHEAT ZONE OF HYDROCARBON DEHYDROGENATION PROCESS

Dennis J. Ward, South Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sep. 16, 1985, Ser. No. 776,282
Int. Cl.[4] C07C 5/333, 5/32
U.S. Cl. 585—441 18 Claims



1. In a process for the catalytic dehydrogenation of a C_3-plus dehydrogenable hydrocarbon wherein a feed stream comprising a feed hydrocarbon is passed into a first bed of dehydrogenation catalyst maintained at dehydrogenation conditions and a dehydrogenation zone effluent stream comprising hydrogen,

the feed hydrocarbon and a product hydrocarbon is produced, the dehydrogenation zone effluent stream and an oxygen-containing gas stream are admixed and passed into a separate bed of selective hydrogen oxidation catalyst maintained at oxidation promoting conditions and an oxidation zone effluent stream is produced, and the oxidation zone effluent stream is passed into a second bed of dehydrogenation catalyst; the improvement which comprises cooling the dehydrogenation zone effluent stream by direct or indirect heat exchange and increasing the amount of heating which is required in the bed of oxidation catalyst over that which would be necessary to achieve the same oxidation zone effluent stream temperature without said cooling.

4,599,472

PURIFICATION OF IODINE-CONTAINING MIXTURES AND COMPOSITIONS USEFUL THEREFOR

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

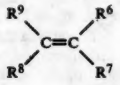
Filed Jun. 27, 1985, Ser. No. 749,361
Int. Cl.[4] C07C *2/64, 2/68*
U.S. Cl. 585—459 **6 Claims**

1. A process for the preparation of alkylaromatic hydrocarbons which comprises:

(1) contacting

(a) at least one monocyclic, bicyclic or tricyclic aromatic compound having 6 up to 30 carbon atoms and

(b) at least one olefinic compound having the formula



wherein each of R^6 through R^9 is independently selected from hydrogen and C_1 through C_{10} alkyl or cycloalkyl radical; or R^6 and R^7 or R^6 and R^9 can be joined as part of a polymethylene or alkyl- or cycloalkyl-substituted polymethylene radical having two to about 20 carbon atoms, wherein said olefinic compound has 4 up to 30 carbon atoms, and wherein said olefinic compound is capable of forming a teritary carbocation under the process conditions in the presence of a catalyst consisting essentially of

(i) AlX_3 and

(ii) I_2;

where each X is individually selected from the halogens;

(2) washing the reaction mixture produced in step (1) with caustic and separating a washed organic layer therefrom;

(3) adding 0.02 to 0.10 wt % of a metal compound to the washed organic layer obtained from step (2); and thereafter

(4) subjecting the mixture produced in step (3) to distillation, wherein the complex MI_n formed upon distillation is non-volatile and essentially non-decomposable under distillation conditions.

4,599,473

PROCESS FOR PARA SELECTIVE ALKYLATION OF AROMATIC HYDROCARBONS

Guy L. G. Debras, Belgrade; Georges E. M. J. De Clippeleir, Sint Pieters Leeuw, and Raymond M. Cahen, Brussels, all of Belgium, assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Dec. 19, 1983, Ser. No. 562,650
Int. Cl.[4] C07C *2/68*
U.S. Cl. 585—467 **14 Claims**

1. A process for the selective alkylation of monoalkylbenzene into dialkylbenzenes wherein the para isomer of the disubstituted product is present in a concentration greater than in a thermodynamic equilibrium, comprising:

passing the monoalkylbenzene and an alkylating agent capable of methylation, ethylation or propylation under conversion conditions through a reaction zone containing an unmodified crystalline silica catalyst of the silicalite type having the monoclinic symmetry.

4,599,474

CONVERSIONS OF LOW MOLECULAR WEIGHT HYDROCARBONS TO HIGHER MOLECULAR WEIGHT HYDROCARBONS USING A METAL-CONTAINING CATALYST

Louis Devries, Greenbrae, and P. R. Ryason, Santa Rosa, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 31, 1983, Ser. No. 547,699
Int. Cl.[4] C07C *2/00*
U.S. Cl. 585—415 **15 Claims**

1. A process for the production of higher molecular weight hydrocarbons from lower molecular hydrocarbons comprising the steps of:

(a) introducing into a reaction zone a lower molecular weight hydrocarbon-containing gas and contacting said gas in said zone with a metal compound-containing catalyst containing a carbide, nitride, boride or oxide of a Group I-A metal, under C_2+ hydrocarbon synthesis conditions such that at least 15 mole percent of the lower molecular weight hydrocarbons in said gas are converted to higher molecular weight hydrocarbons, said conditions including a temperature of greater than 1000° C. and a gas hourly space velocity of greater than 3200 hr^{-1};

(b) withdrawing from said reaction zone a higher molecular weight hydrocarbon-containing stream.

4,599,475

PROCESS FOR XYLENE ISOMERIZATION USING ZSM-23 ZEOLITE

Charles T. Kresge, Ellicott City, Md.; James C. Vartuli, West Chester, Pa., and Michael P. Nicoletti, Turnersville, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 662,750, Oct. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 536,471, Sep. 28, 1983, abandoned. This application Jun. 19, 1985, Ser. No. 747,736
Int. Cl.[4] C07C *5/22*
U.S. Cl. 585—481 **14 Claims**

1. A process for isomerizing an isomerization feed containing an aromatic C_8 mixture of ethylbenzene and xylene by which ethylbenzene and m-xylene conversion is enhanced, said process comprising contacting said feed under conversion conditions with a catalyst comprising ZSM-23 zeolite having a silica to alumina ratio of at least about 12, which zeolite is capable of sorbing greater than about 3 weight percent cyclohexane and greater than about 6.1 weight percent n-hexane.

4,599,476

PROCESS FOR THE PREPARATION OF DIMERIZATION PRODUCTS FROM OLEFINS

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 3, 1985, Ser. No. 783,706
Claims priority, application Netherlands, Dec. 19, 1984, 8432042
Int. Cl.[4] C07C *2/26*
U.S. Cl. 585—511 **16 Claims**

1. A process for the preparation of dimerization products from aliphatic mono-olefins having 2-12 carbon atoms which process comprises contacting the aliphatic mono-olefin with a catalytic system formed by combining a palladium and/or ruthenium compound and an acid with a pKa of less than 2, except hydrohalogenic acids, in an aprotic organic solvent.

4,599,477

OXIDATIVE-DEHYDROGENATION PROCESS

Paul R. Robinson, and Eric L. Moorehead, both of Diamond Bar, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 749,557, Jun. 27, 1985, abandoned, which is a division of Ser. No. 667,000, Oct. 31, 1984, which is a continuation-in-part of Ser. No. 646,291, Aug. 29, 1984, Ser. No. 595,333, Mar. 30, 1984, Ser. No. 592,422, Mar. 21, 1984, Pat. No. 4,555,584, Ser. No. 492,226, May 6, 1983, Ser. No. 492,163, May 6, 1983, and Ser. No. 461,942, Jan. 28, 1983, Pat. No. 4,481,363, which is a division of Ser. No. 289,806, Aug. 3, 1981, Pat. No. 4,388,221, said Ser. No. 646,291, is a continuation-in-part of Ser. No. 461,942, , which is a division of Ser. No. 289,806, , said Ser. No. 595,333, is a division of Ser. No. 335,531, Dec. 29, 1981, Pat. No. 4,455,388, which is a continuation-in-part of Ser. No. 328,446, Dec. 7, 1981, Pat. No. 4,454,245, said Ser. No. 592,422, is a division of Ser. No. 328,446, , said Ser. No. 492,226, and Ser. No. 492,163, each is a continuation-in-part of Ser. No. 275,370, Jun. 19, 1981, abandoned. This application Oct. 30, 1985, Ser. No. 793,494

Int. Cl.[4] C07C *11/18*

U.S. Cl. 585—622 9 Claims

1. A method for producing a diolefin which comprises contacting molecular oxygen and a C_4+mono-olefin under reaction conditions with an oxidative dehydrogenation catalyst comprising vanadium, phosphorus, and an alkali metal component.

4,599,478

THERMAL CRACKING METHOD FOR PRODUCING OLEFINES FROM HYDROCARBONS

Makoto Kamisaka; Toshiro Okamoto, both of Tokyo; Michio Ohshima, and Mamoru Tamai, both of Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

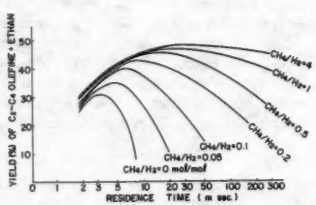
Continuation of Ser. No. 581,256, Feb. 17, 1984, Pat. No. 4,527,002. This application Feb. 27, 1985, Ser. No. 705,976

Claims priority, application Japan, Feb. 18, 1983, 58-25797

The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.

Int. Cl.[4] C07C *4/04*

U.S. Cl. 585—648 5 Claims



1. A thermal cracking method for producing olefines from hydrocarbons which comprises burning hydrocarbon with oxygen in the presence of steam to produce a high-temperature gas containing steam of 1500°–3000° C., supplying methane and hydrogen into said high-temperature gas containing steam, with the mol ratio of methane to hydrogen in said high temperature gas being more than 0.05, then supplying hydrocarbon to be cracked into said high-temperature gas containing said methane, hydrogen and steam, thermally cracking said hydrocarbon under conditions of partial pressure of hydrogen of more than at least 0.1 bar at the outlet of a reaction vessel at a temperature of 800°–1200° C. and at a residence time of 5–300 milli second, and rapidly cooling the reaction product thus obtained.

4,599,479

THERMAL CRACKING PROCESS FOR PRODUCING OLEFINS FROM HYDROCARBONS

Toshiro Okamoto, Tokyo, and Michio Ohshima, Hiroshima, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

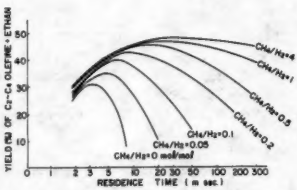
Continuation of Ser. No. 583,939, Feb. 27, 1984, Pat. No. 4,527,003. This application Feb. 27, 1985, Ser. No. 705,974

Claims priority, application Japan, Mar. 3, 1983, 58-34928

The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.

Int. Cl.[4] C07C *4/04*

U.S. Cl. 585—648 6 Claims



1. A thermal cracking process for producing olefins from hydrocarbons which comprises the steps of partially burning a hydrocarbon with less than the theoretical amount of oxygen in the presence of steam to give a hot gas of from 1400° to 3000° C. comprising steam and hydrogen; feeding to the hot gas comprising steam and hydrogen, a mixture of methane and hydrogen so that the methane/hydrogen molar ratio in the hot gas is about 0.05; further feeding a starting hydrocarbon to the hot gas mixture comprising the methane, hydrogen and steam; subjecting the starting hydrocarbon to thermal cracking while keeping the partial pressure of hydrogen at least 0.1 bar at the outlet of a reactor, the temperature at 800° to 1200° C., and the residence time at 5 to 300 milliseconds; and quenching the resulting reaction product.

4,599,480

SEQUENTIAL CRACKING OF HYDROCARBONS

Robin L. Buddell, Kenner; Audrey M. Oswald, Destrehan, and William A. Lagarde, Norco, all of La., assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 12, 1985, Ser. No. 755,035

Int. Cl.[4] C07C *4/02*

U.S. Cl. 585—650 37 Claims

1. A process for the production of ethylene from the pyrolytic cracking of a hydrocarbon consisting essentially of ethane in a pyrolytic cracking furnace having disposed therein a plurality of elongated serpentine-situated thermal cracking tubes which comprises:

(a) passing a first hydrocarbon feed material having a carbon atom content of greater than 2 through said plurality of elongated serpentine-situated thermal cracking tubes to crack said first hydrocarbon at cracking conditions effective to produce a first hydrocarbon product and coke, wherein said cracking conditions and throughput of said first hydrocarbon is sufficient to selectively place an amorphous relatively smooth coat of coke on the interior of said plurality of elongated serpentine-situated thermal cracking tubes, wherein said coat of coke is of thickness of about between about 1/16 inch and about ¼ inch;

(b) stopping said passage of said first hydrocarbon feed material through said thermal cracking tubes; and

(c) passing a second hydrocarbon consisting essentially of said ethane through said plurality of elongated serpentine-situated thermal cracking tubes having said coat of amorphous relatively smooth coat of coke thereon at ethane cracking conditions to crack said ethane to ethylene, which is recovered from said pyrolytic cracking furnace.

4,599,481

PROCESS FOR THE PREPARATION OF HYDROCARBONS

Martin F. M. Post, and Swan T. Sie, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 31, 1985, Ser. No. 761,117

Claims priority, application Netherlands, Sep. 13, 1984, 8402807

Int. Cl.[4] C07C 2/00

U.S. Cl. 585—700 16 Claims

1. A process for the preparation of hydrocarbons by catalytic reaction of carbon monoxide with hydrogen, wherein a mixture of carbon monoxide and hydrogen is contacted at a temperature of 125°–350° C. and pressure of 5–100 bar with a catalyst comprising cobalt supported on a carrier, the cobalt being distributed over the carrier in such a way as to satisfy the relation

$$(\Sigma V_p/\Sigma V_c)<0.85,$$

wherein ΣV_c represents the total volume of the catalyst particles under consideration and ΣV_p is found by totalizing the peel volume present in the catalyst particles, when the latter is taken to be composed of a kernel surrounded by a peel, the kernel being of such a shape that at every point of the kernel perimeter the shortest distance (d) to the perimeter of the peel is the same, and that d is equal for all catalyst particles under consideration and has been chosen such that the quantity of cobalt present in ΣV_p is 90% of the quantity of cobalt present in ΣV_c.

4,599,482

SEMICONDUCTOR PHOTOELECTRIC CONVERSION DEVICE AND METHOD OF MAKING THE SAME

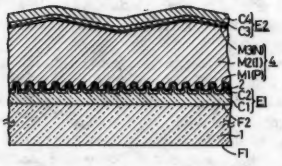
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Lab. Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1984, Ser. No. 586,699

Claims priority, application Japan, Mar. 7, 1983, 58-36850; Oct. 18, 1983, 58-194878

Int. Cl.[4] H01L *31/18*

U.S. Cl. 136—259 16 Claims



1. A semiconductor photoelectric conversion device, comprising:

a light transparent substrate;

a light transparent conductive layer formed on the light transparent substrate to serve as a first electrode;

a non-single-crystal semiconductor laminate member having a P- or N-type first non-single-crystal semiconductor layer formed on the conductive layer serving as the first electrode, an I-type second non-single-crystal semiconductor layer formed on the first non-single-crystal semiconductor layer and a third non-single-crystal semiconductor layer formed on the second non-single-crystal semiconductor layer and opposite in conductivity type from the first non-single-crystal semiconductor layer; and

a conductive layer formed on the non-single-crystal semiconductor laminate member to serve as a second electrode;

wherein the first non-single-crystal semiconductor layer of the non-single-crystal semiconductor laminate member is formed of Si_xC_{1-x} (where $0>x>1$) or a material consisting principally thereof;

wherein the surface of the conductive layer serving as the first electrode is a first uneven surface which includes a number of surfaces of acicular convexities arranged two-dimensionally to form a first uneven boundary corresponding to the first uneven surface between the conductive layer serving as the first electrode and the first non-single-crystal semiconductor layer of the non-single-crystal semiconductor laminate member;

wherein the conductive layer serving as the second electrode is reflective; and

wherein the surface of the non-single-crystal semiconductor laminate member in contact with the conductive layer serving as a second electrode is a second uneven surface which includes a number of surfaces of convexities arranged two-dimensionally at a mean periodicity larger than that of the acicular convexities of the first unevne surface to thereby form a second uneven boundary corresponding to the second uneven surface between the non-single-crystal semiconductor laminate member and the conductive layer serving as the second electrode.

4,599,483

SIGNAL CABLE

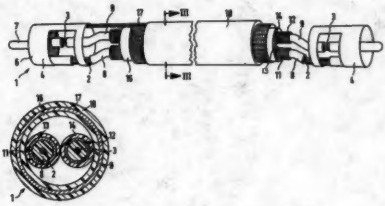
Volker Kühn, and Thomas Kühn, both of Malsch, Fed. Rep. of Germany, assignors to Audioplan Renate Kuhn, Malsch, Fed. Rep. of Germany

Filed Oct. 12, 1984, Ser. No. 660,090

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1983, 3337432

Int. Cl.[4] H02B *7/34*

U.S. Cl. 174—36 9 Claims



1. A signal cable, such as an amplifier cable, comprising two juxtaposed insulated conductors with associated connecting elements, wherein each conductor is individually surrounded by a coaxial screen which is electrically insulated from its associated conductor, and each screen being electrically insulated with respect to one another and from the connecting elements.

4,599,484

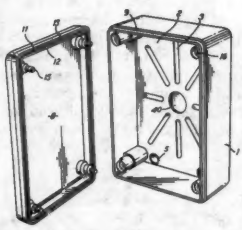
BOX FOR ELECTRICAL COMPONENTS

David W. Bramwell, Prestatyn, Wales, assignor to EGA Limited, United Kingdom

Filed Jul. 9, 1984, Ser. No. 628,810

Int. Cl.[4] H05K *5/02*

U.S. Cl. 174—52 R 6 Claims



1. A box for electrical components, comprising:

(a) a bottom wall and side walls with the interior surface of at least said bottom wall being provided with at least one elongated groove,

(b) said groove having a lower portion, an upper portion and a pair of spaced upper edges,

(c) said groove being defined by a channel extending below said bottom wall and said side walls of the box extending below said bottom wall with the lower exterior surface of said channel being substantially flush with the lower edges of said side walls,

(d) said groove having sufficient depth and being otherwise dimensioned to receive and engage self-tapping or thread cutting screws for securing electrical components within the box,

(e) said lower portion of said groove having elongated parallel sides,

(f) said upper portion of said groove being formed by elon-

gated converging surfaces which extend from said upper edges to said lower portion of said groove, and

(g) the construction being such as to provide means for functionally receiving more than one size of said screws.

4,599,485

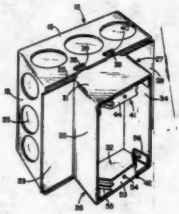
ELECTRICAL RECEPTACLE BOX ASSEMBLY

Robert A. Smolik, 670 W. Seventh St., St. Paul, Minn. 55102

Filed Dec. 21, 1984, Ser. No. 684,695

Int. Cl.⁴ H02G *3/10*

U.S. Cl. 174—57 **16 Claims**



1. An electrical receptacle box assembly for positionally adjustable offset mounting of an electrical receptacle, comprising:

an electrical receptacle box fixable to a all stud and having side walls defining a front opening;

a cover mounted on the electrical receptacle box in covering relationship to the front opening, said cover having an open frame extended forward of the front opening of the box for offset mounting of an electrical receptacle;

said frame carrying first and second spaced-apart brackets forwardly offset from the front opening of the box, said first bracket having a front mounting face for mounting a first portion of an electrical receptacle, and first and second oppositely extended lateral bendable arms, each of said arms having an inward loop and an outer end fixed to the frame, said second bracket having a front mounting face for mounting a second portion of an electrical receptacle, and first and second lateral oppositely extended lateral bendable arms, each of said arms having an inward loop and an outer end fixed to the frame, wherein the first and second arms of the first and second brackets are bendable to adjust the position of the mounting face of the first and second brackets to positionally adjust an electrical receptacle mounted on the brackets with respect to the box.

4,599,486

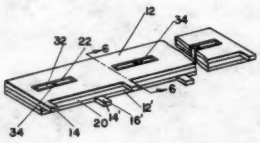
HIGH CAPACITANCE BUS BAR INCLUDING MULTILAYER CERAMIC CAPACITORS

Jorge M. Herrandez, Mesa, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed Sep. 6, 1985, Ser. No. 773,431

Int. Cl.⁴ H01B *7/00*

U.S. Cl. 174—72 B **7 Claims**



1. A surface mountable bus bar assembly comprising:

insulating means, said insulating means being comprised of a flat elongated strip of non-conductive material having oppositely disposed first and second faces, said insulating means being provided with at least a first aperture extending therethrough between said faces;

a first bus bar conductor, said first bus bar conductor being bonded to said first face of said insulating means, said first bus bar conductor being provided with at least a first aperture which extends therethrough, said first bus bar aperture being in registration with said first aperture of said insulating means;

a second bus bar conductor, said second bus bar conductor being bonded to said second face of said insulating means, said second bus bar conductor being provided with at least a first aperture which extends therethrough, said second bus bar aperture being in registration with said first aperture of said insulating means;

said first and second bus bar conductors each including leads extending therefrom, said leads being adapted for surface mounting;

at least one multilayer capacitor means, said multilayer capacitor means being comprised of a dielectric material having a high dielectric constant, said capacitor means having a pair of side layers of conductive material on a first pair of oppositely disposed side faces of said capacitor means, said capacitor means being positioned within said registered apertures of said insulating means and said first and second bus bar conductors with said side layers of conductive material being oriented substantially parallel to said insulating means first and second faces and said first and second bus bar conductors;

first means electrically connecting one of the conductive side layers of said capacitor means to said first bus bar conductor; and

second means electrically connecting the other of the conductive side layers of said capacitor means to said second bus bar conductor.

4,599,487

CABLE GLAND

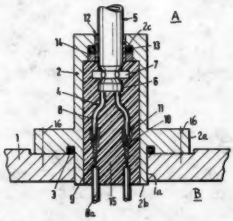
Wilhelm Blank, Speichersdorf; Ernst Roth, and Reinhard Tellbach, both of Pegnitz, all of Fed. Rep. of Germany, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,325

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1984, 3412786

Int. Cl.⁴ H01B *17/30;* H02G *15/013;* F04D *29/08*

U.S. Cl. 174—151 **13 Claims**



1. A gland for sealing a hole which is provided in a wall separating two different atmospheres and serves to allow for the passage of at least one electrical conductor, comprising a hollow housing sealingly secured to and extending through the hole of the wall, said housing having an aperture at one side of the wall and the one conductor extending through said housing and outwardly by way of said aperture; a sheath partially surrounding the one conductor in said housing so that a portion of the one conductor in the housing remains bare; a bead provided on the bare portion of the one conductor in said

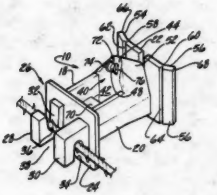
housing; a sleeve shrunk onto the one conductor between said bead and said sheath so that said sleeve sealingly engages the sheath; an elastomeric sealing element sealingly installed in said aperture and sealingly surrounding the one conductor in the aperture; and a mass of hardened filler material filling the interior of said housing so that said bead, the bare portion of the one conductor and said sheath are embedded in the filler material.

4,599,488

UNIVERSAL NAIL-ON INSULATOR

Robert M. Wilson, Jr., Battle Creek, Mich., assignor to Dare Products, Inc., Battle Creek, Mich.

Filed Sep. 12, 1985, Ser. No. 775,339
Int. Cl.[4] H01B *17/16, 17/24*
U.S. Cl. 174—158 F **10 Claims**



1. A nail-on electric fence insulator for installation on flat and round wood posts, said insulator being molded as a single piece body comprising, in combination: a forward mounting panel for attachment to a post in a generally vertically extending plane; an intermediate angled, nail holding and guiding surface; rearward extending wire holding means; aligned aperture means through said intermediate angled surface and said mounting panel forming a passageway to receive a nail extending downwardly at an acute angle to the horizontal from said intermediate surface through said mounting panel; a pair of vertically extending wings, one at each lateral edge of said mounting panel extending forwardly of said panel from vertical hinge lines; whereby as said insulator is affixed to a wood post by hammering a nail extending through said aperture means, said wings will engage the periphery of a round post to firmly hold said insulator thereagainst without twisting, and as said wings engage a flat post they will fold rearwardly along said vertical hinge lines presenting planar contact therewith.

4,599,489

SOLID STATE KEY FOR CONTROLLING ACCESS TO COMPUTER SOFTWARE

William P. Cargile, Half Moon Bay, Calif., assignor to Gordian Systems, Inc., Palo Alto, Calif.

Filed Feb. 22, 1984, Ser. No. 582,302
Int. Cl.[4] G06K *5/00*
U.S. Cl. 178—22.08 **20 Claims**

1. Apparatus for affording access by a user to a software program residing in a computer, comprising an access key capable of generating a password and of being transported independently of the computer and an access key verification means adapted to be resident in the computer, for verifying a password generated by the access key and allowing access and use to the software program wherein:

said access key includes:

(a) pulse generating means for generating a signal that is dependent in the elapse of time;

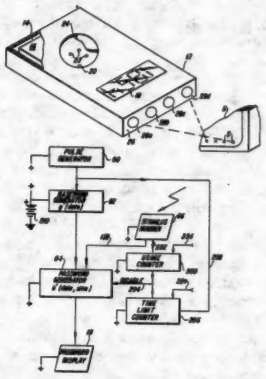
(b) password generating means coupled to said pulse generating means for generating a password from the signal from said pulse generating means;

(c) displaying means communicating with the password generating means for displaying at least part of said password; and

said access key verification means includes:

(a) means for receiving at least initially a time input;

(b) means for receiving the password as generated by the access key and input by the user;



(c) means for processing the time input for producing an internal password;

(d) means for determining if the internal password bears a prescribed relationship to the password generated by said access key;

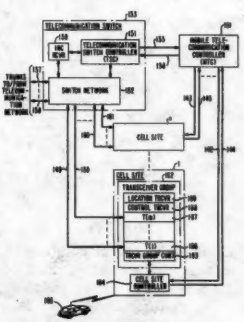
(e) means for affording access to the software program if the prescribed relationship exists.

4,599,490

CONTROL OF TELECOMMUNICATION SWITCHING SYSTEMS

Ronald G. Cornell, Wheaton; George D. Huensch, Aurora; Kenneth W. Shelhamer, Naperville, and Pramod Warty, Woodridge, all of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 19, 1983, Ser. No. 563,254
Int. Cl.[4] H04Q *7/04*
U.S. Cl. 179—2 EB **28 Claims**



1. A telecommunication system for communicating between a telecommunication network and a plurality of telecommunication units each having an associated identity code, comprising:

telecommunication switch means for connection to said telecommunication network via a plurality of first com-

munication links, comprising signaling means for receiving incoming call requests from said telecommunication network;

a plurality of second communication links connected to said telecommunication switch means;

interconnecting means responsive to control signals for interconnecting said plurality of second communication links and said telecommunication units;

a telecommunication control complex;

data communication means interconnecting said telecommunication switch means and said telecommunication control complex;

said telecommunication switch means being responsive to an incoming call request associated with one of said first communication links and comprising an identity code associated with at least one of said telecommunication units, to generate and transmit an incoming call request message comprising identification data representing said incoming call request identity code to said telecommunication control complex over said data communication means;

said telecommunication control complex being responsive to said incoming call request message to generate a control signal to said interconnecting means to connect one of said telecommunication units corresponding to said identification data to one of said second communication links, and to generate and transmit over said data communication means a response message comprising the identity of said one of said second communication links; and

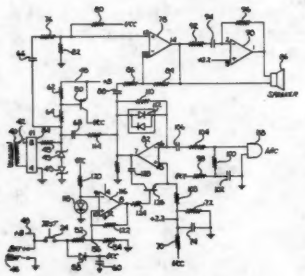
said telecommunication switch means being responsive to said response message to connect said one of said first communication links to said one of said second communication links.

4,599,491

APPARATUS FOR CONVERTING DIRECT COUPLED DATA DEVICES TO ACOUSTIC COUPLED DATA DEVICES

Arthur L. Serrano, Canoga Park, Calif., assignor to Novation, Inc., Chatsworth, Calif.

Filed Jul. 9, 1984, Ser. No. 629,096
Int. Cl.[4] H04M *11/00*
U.S. Cl. 179—2 C **7 Claims**



1. A coupling unit for acoustic coupling to a telephone line, a direct connect digital device intended to operate by the direct connection thereof to a telephone line, comprising:

microphone means for receiving acoustic signals from a speaker in a telephone handset;

speaker means for providing acoustic signals to a microphone in a telephone handset;

connector means for connecting said coupling unit to the telephone line connection of a direct connect digital device;

electronic means coupled to said microphone means, said speaker means and said connector means, said electronic means being a means for coupling an electronic signal from said microphone means to said connector means, and coupling an electronic signal from said connector means to said speaker means, said electronic means further including means for eliminating the electronic signal of said microphone means from said speaker means.

5. A coupling unit for acoustic coupling to a telephone line, a direct connect digital device intended to operate by the direct connection thereof to a telephone line, comprising:

microphone means for receiving acoustic signals from a speaker in a telephone handset and providing a microphone signal in response thereto;

speaker means for providing acoustic signals to a microphone in a telephone handset in response to a speaker signal provided thereto;

connector means for connecting said coupling unit to the telephone line connection of a direct connect digital device;

means coupled to said connector means for simulating at least a minimum telephone line loop current;

first electronic means for coupling said microphone means to said connector means to couple said microphone signal to said connector means;

second electronic means for coupling a line signal received by said connector means to said speaker means, whereby said first and second electronic means are both coupled to said connector means;

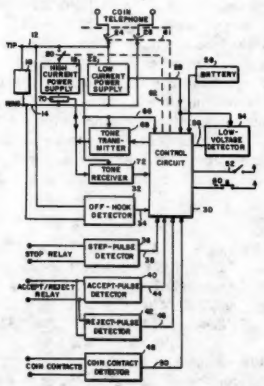
said first and second electronic means further including means for combining said line signal and said microphone signal to substantially eliminate a line signal originating in said microphone means from said speaker means.

4,599,492

COIN-TELEPHONE AUDITOR

David Otten, 58 Grove Hill Park, Newton, Mass. 02160

Filed Dec. 27, 1983, Ser. No. 567,041
Int. Cl.[4] H04M *17/02*
U.S. Cl. 179—6.3 R **7 Claims**



1. A coin-telephone auditor for a pay telephone that accepts coins, stores them in a coin receptacle, is connected to a telephone circuit by which it communicates with a central office that connect it to other telephone stations on a telephone circuit, and is operable by users to place calls to other telephones on the telephone circuit, the auditor comprising:

A. a dial-and-signaling circuit connected to the telephone circuit and operable by application of control signals thereto to apply dial and data signals to the telephone circuit to cause the central office to connect the auditor to a telephone station indicated by the dial signals for trans-

mission to that station of information represented by the data signals; and

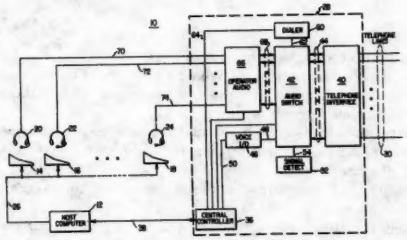
B. a monitor circuit for monitoring the quantity of coins in the coin receptacle of the coin telephone, determining whether the quantity of coins has reached a predetermined level by comparing to the predetermined level an index to which the relative contributions of coins of different denominations differ in accordance with their relative physical sizes, and if the quantity of coins has reached the predetermined level, operating the dial-and-signaling circuit to cause it to dial up a predetermined telephone station on the telephone circuit in response and transmit to the predetermined telephone station data signals representing the quantity of coins in the receptacle.

4,599,493

MULTI-LINE TELEPHONE CONTROL SYSTEM

Ellis K. Cave, Garland, Tex., assignor to TBS International, Inc., Richardson, Tex.

Filed Aug. 28, 1984, Ser. No. 644,971
Int. Cl.[4] H04M *3/46*
U.S. Cl. 179—18 FH **6 Claims**



1. A method for providing a continuous sequence of telephone calls to a plurality of operators each having a display terminal and a bidirectional audio communications device wherein a plurality of records are stored in a host computer which drives the display terminals, each of the records including a telephone number and other information, comprising the steps of:

(a) transferring a plurality of stored telephone numbers from said host computer to a controller,

(b) placing each of a plurality of calls by dialing one of said numbers on an available one of a plurality of telephone lines in response to said controller,

(c) after the dialing of said one number, detecting a line condition other than busy or ring to indicate an answer to the call,

(d) for each call answer, connecting the answered one of the telephone lines to the audio communications device for a non-busy one of said operators,

(e) for each call answer, transferring an identification of the number at which the call was answered and the one operator having the connected line to said host computer,

(f) in response to said transferred identification of said number at which the call was answered and said one operator, said host computer transmits at least a part of the stored record corresponding to the telephone number for the answered call to the display device for said one operator whereby information from said record is displayed to said one operator concurrent with said one operator having audio communication through said answered line, said one operator thereby being designated as busy until completion of the telephone call on the answered line, and

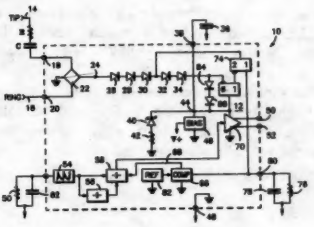
(g) repeating steps (b) through (f) attempting to keep all of said operators busy.

4,599,494

RING SENSE TELEPHONE TONE RINGER CIRCUIT

Dennis L. Welty, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 10, 1984, Ser. No. 656,199
Int. Cl.[4] H04M *1/00*
U.S. Cl. 179—84 T **13 Claims**



11. An integrated electronic telephone ringer circuit including rectifier circuit means for rectifying an alternating current (ac) voltage ringing signal applied thereto at inputs of the ringer circuit, circuit means for converting the rectified voltage to a rectified current, tone generation circuitry for producing a tone ringing signal at an output of the ringer circuit when enabled, and sense circuit means for enabling the tone generation circuitry when the ac voltage ringing signal exceeds a predetermined threshold level, the sense circuit including comparator circuitry for comparing the magnitude of a reference potential with the magnitude of a variable direct current voltage to produce an enabling signal to the tone generation circuit when the magnitude of the dc voltage exceeds the magnitude of the reference, the improvement comprising:

the sense circuit including current mirror means for diverting a small portion of the rectified current to a first output while the remainder of the rectified current is sourced at a second output; and

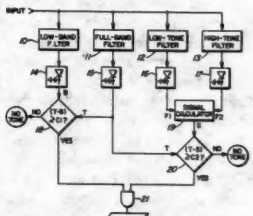
load circuit means coupled to said first output of said current mirror means for producing the direct current voltage the magnitude of which varies in direct relationship to the ac ringing signal.

4,599,495

APPARATUS FOR MULTIFREQUENCY SIGNALLING TONE DETECTION

Robert D. Richards, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Feb. 28, 1985, Ser. No. 706,823
Int. Cl.[4] H04M *1/00*
U.S. Cl. 179—84 VF **5 Claims**



1. Apparatus for indicating of signalling tones in an input signal in presence of noise, comprising:

a plurality of filter means each having an output level repre-

sentative of spectral power within a predetermined frequency band of said input signal:

first summing means for subtracting output levels of a first predetermined pair of filters in said plurality of filter means to yield a power difference level;

means for calculating the input level from output levels of a second predetermined pair of filters in said plurality of filter means;

second summing means for subtracting said input signal level from the output level of a predetermined one of said plurality of filter means to yield a signal-to-noise ratio related level; and

means for indicating presence of a signalling tone in said input signal when said first and second summing means simultaneously yield levels exceeding predetermined first and second thresholds, respectively.

4,599,496

VARIABLE CONTROL DEVICE

Thomas H. Lecklider, 27 Farmadine, Saffron Walden, Essex, England (CB113HR)

PCT No. PCT/GB84/00036, § 371 Date Oct. 9, 1984, § 102(e) Date Oct. 9, 1984, PCT Pub. No. WO84/03172, PCT Pub. Date Aug. 16, 1984

PCT Filed Feb. 10, 1984, Ser. No. 673,701

Claims priority, application United Kingdom, Feb. 10, 1983, 8303679

Int. Cl.⁴ H01H *13/64, 1/06*

U.S. Cl. 200—1 B **1 Claim**

1. A variable control device comprising:

a manually operable member moveable in a first direction,

a substrate provided with a plurality of contacts spaced apart in a plane transverse to said first direction,

a further member disposed between the manually operable member and the substrate, the further member being resiliently deformable in response to pressure being applied to the manually operable member in the first direction,

the manually operable member and the further member being formed of a single resilient member shaped to provide the manually operable member as a key portion and the further member as a bulbous contact-making portion,

the further member being provided with a conductive surface facing the substrate and having a substantially cylindrical cross-section when viewed in a direction transverse to the first direction,

the conductive surface progressively bridging the contacts in the substrate in response to deformation of the further member such that the output produced by the number of contacts bridged increases with an increase in pressure to the manually operable member.

4,599,497

SINGLE AND DUAL IN-LINE PACKAGE SWITCH

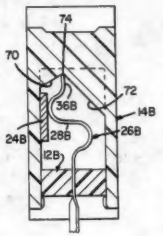
William H. Rose; David T. Shaffer, and Philip J. Walker, all of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 671,537, Nov. 15, 1984, which is a continuation of Ser. No. 485,549, Apr. 15, 1983, Pat. No. 4,496,802. This application Nov. 30, 1984, Ser. No. 677,116

The portion of the term of this patent subsequent to Jan. 2, 2002, has been disclaimed.

Int. Cl.⁴ H01H *5/18*

U.S. Cl. 200—5 R **10 Claims**



1. An electrical switch, comprising:

a dielectric housing along which a plurality of contact members are located in actuating alignment with stationary electrical contact means;

actuating means movably mounted in said dielectric housing and associated with respective movable ones of said contact members;

each of said movable contact members has a curved contact section;

said actuating means when moved to one position moving the respective movable contact section into electrical engagement with said stationary contact means, said actuating means when moved to another position moving the respective movable contact section free of the stationary contact means; and

means provided by a selected one of said contact members and said housing maintaining the contact section of said selected contact member in continuous electrical engagement with said stationary contact means.

4,599,498

TAMPER SWITCH

Shigeo Shimoya, Kitamoto, and Hikoji Iwasaki, Konosu, both of Japan, assignors to Kobishi Electric Co., Ltd., Tokyo, Japan

Filed Jan. 14, 1985, Ser. No. 691,276

Int. Cl.⁴ H01H *15/00, 3/16, 13/50*

U.S. Cl. 200—16 B **3 Claims**

1. A tamper switch comprising:

(a) a casing;

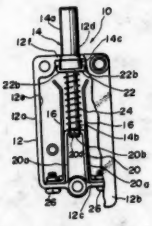
(b) an elongated tamper element mounted on said casing for movement along an axis thereof between an inoperative and an operative position, one end of said tamper element extending exteriorly of said casing;

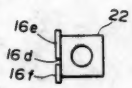
(c) urging mens for normally urging said tamper element into one of said operative and inoperative positions;

(d) a contact element fixedly mounted on said tamper element for movement therewith, said contact element having a pair of parallel planar engaging portions; and

(e) a pair of elongated planar resilient contact plates mounted within and fixedly secured to said casing at their one ends, said pair of contact plates being disposed in generally parallel opposed relation to each other, said contact element being urged in between said pair of contact plates to cause said engaging portions to make electrical contact with said pair of contact plates, respectively, when said tamper element is brought into said

operative position, each of said contact plates having a slit extending along substantially a major portion of the length thereof and opening to the other end thereof to provide a pair of closely spaced contact portions each capable of





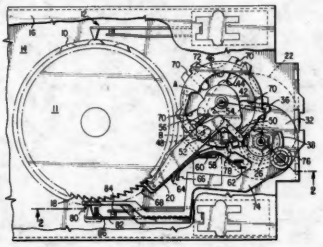
being twisted along a length thereof, so that said pair of contact portions of each contact plate are brought into contact with a respective one of said engaging portions generally across the entire widths of the engaging portions.

4,599,499

FAST IMPULSE TIMER DRIVE MECHANISM

John P. Duve, Brookfield, Ill., assignor to Controls Company of America, Schiller Park, Ill.

Filed Jul. 26, 1985, Ser. No. 759,541
Int. Cl.[4] H01H *43/00*
U.S. Cl. 200—35 R **7 Claims**



1. A program timer of the type having a continuously driven motor, a plurality of timing cams mounted on a rotating member and controlling the operation of switches in a predetermined program, a ratchet track on the rotating member, and a drive pawl operatively associated with the ratchet track and the motor for advancing the rotating member in a step-by-step manner, characterized by:

a rotatable drive cam having a camming surface for defining the drive stroke of said drive pawl, said camming surface being included within a fixed angle of 360°/N around the axis of rotation of said drive cam, where N is an integer greater than 1;

a cam follower on said drive pawl cooperating with said camming surface; and

drive means coupled between said motor and said drive cam for intermittently rotating said drive cam by said fixed angle, said drive means and said drive cam being so synchronized that all of said camming surface engages said cam follower during a single intermittent movement of said drive cam.

6. A program timer according to claim 1 further characterized by:

a sub-interval cam formed on said drive cam;

a sub-interval switch;

a sub-interval lever having a cam follower end and a switch actuator end; and

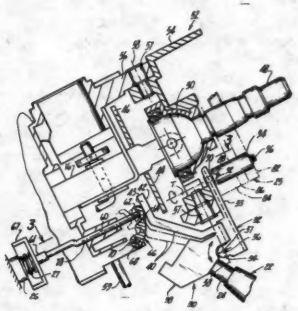
means for mounting said lever for pivoting motion with said cam follower end cooperating with said sub-interval cam and said switch actuator end cooperating with said sub-interval switch so that said sub-interval switch is alternately opened and closed in accordance with the contour of said sub-interval cam as said drive cam is rotated.

4,599,500

TILT STEERING COLUMN HEAD MOUNTED SWITCH OPERATING CONTROL

Harry E. Wilcox, Plymouth, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 1, 1985, Ser. No. 718,780
Int. Cl.[4] H01H *3/16, 9/00*
U.S. Cl. 200—61.54 **1 Claim**



1. In combination,

a vehicle steering column having upper and lower steering shafts for rotation about a steering axis, universal joint means pivotally interconnecting said steering shafts so that said upper shaft can turn said lower shaft and be movable about a generally horizontal tilt axis to a plurality of angular positions with respect to said lower shaft, a steering wheel secured to the free end of said upper shaft for rotating said upper and lower shafts, a stationary tilt head support disposed around said lower shaft, a tilt head assembly disposed around said upper shaft and rotatably supporting said upper steering shaft,

a turn signal switch having a stationary portion affixed to said tilt head assembly,

a movable contactor portion pivotally mounted on and relative to said stationary portion about a first axis extending longitudinally of the steering column,

a headlamp beam dimmer switch having a downwardly depressible spring-biased plunger thereon, said dimmer switch mounted on said steering column in a location longitudinally displaced from said turn signal switch,

an actuation rod mounted for reciprocation on and extending longitudinally of said steering column having first and second ends, said rod first end in engagement with said dimmer switch plunger for depressible actuation thereof upon longitudinal reciprocation of said rod,

a control lever extending transversely of the longitudinal axis of said steering column and swingably movable in a first plane transverse to said steering axis of said steering

column and in a second plane intersecting and mutually orthogonally related to said first plane,

a motion translating assembly enabling selective actuation of said turn signal switch independently of said dimmer switch upon swingable movement of said control lever in said first plane and selective actuation of said dimmer switch plunger independently of said turn signal switch upon swingable movement of said lever in said second plane,

said motion translating assembly having a first member drivingly coupled to one end of said movable contactor portion of said turn signal switch for rocking said movable turn signal contactor portion about said first axis upon swingable movement of said control lever in said first plane and,

a second member affixed to said control lever and pivotally coupled to the other end of said first member of said motion translating assembly for movement relative thereto on a second axis spaced from and normal to said first axis upon swingable movement of said control lever in said second plane, said second member of said motion translating assembly having an arm portion thereon extending inwardly toward said steering column, the improvement wherein:

said tilt head axis being oriented so as to intersect said second axis in an orthogonal manner,

said arm portion terminating in a camming finger formed with a rounded surface, said finger extending in a transverse direction substantially parallel to said tilt axis,

a dimmer switch plunger actuating cam member pivotally mounted on said tilt head support for pivotal movement about a cam axis disposed in an orthogonal offset manner to said first axis,

said cam member having first and second oppositely facing surfaces, said first surface formed with a compound-curved shaped camming surface and said second surface formed with a pocket capturing the other end of said rod, said rod having its longitudinal axis aligned in axial registration with said first axis corresponding to the pivot axis of the movable portion of said turn signal switch,

said compound-curved first surface defining a plurality of normally oriented convex curved and concave curved line elements, said compound curved first surface having each of its convex curved line elements lying in a plane intersecting said cam pivot axis at a right-angle and each of its concave curved line elements lying in a plane intersecting said tilt axis at a right angle, whereby upon said tilt head being pivoted about said tilt axis throughout a predetermined arc said finger rounded surface maintains operative sliding contact with one of said concave curved line elements such that upon swingable movement of said control lever in said second plane said finger is moved toward said cam member causing said finger rounded surface to wipe along a convex curved line element of said first surface so as to pivot said cam member toward said dimmer switch resulting in longitudinal reciprocal movement of said rod and depressible actuation of said dimmer switch spring-biased plunger.

4,599,501

SWITCH ACTUATING MECHANISM HAVING RESILIENT MEANS FOR DISPLACEMENT TRANSMISSION

Robert S. Migrin, Dearborn, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Oct. 2, 1984, Ser. No. 656,824
Int. Cl.[4] H01H *21/22*
U.S. Cl. 200—156 **14 Claims**

1. An electrical switch comprising:

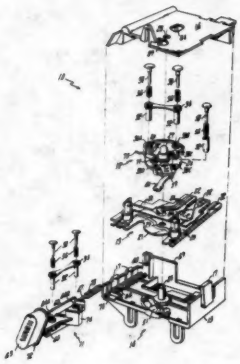
a housing;

a carriage movable in said housing between first and second positions;

electrical contact means mounted on and moving with said carriage;

a conductive contact surface fixed in said housing for engagement by said contact means;

first actuating means, said actuating means being manually actuatable from a first to a second position;



drive means carried by said first actuating means along a path;

resilient reaction means affixed to said carriage and extending into said path for engagement with and displacement by said drive means; and

said carriage being displaced from said first to said second position by said displacement of said reaction means.

4,599,502

INDUCTION HARDENING OF STEEL

Ashok Khare, and Paul Duliba, both of Warren, Pa., assignors to National Forge Company, Irvine, Pa.

Filed Nov. 22, 1983, Ser. No. 554,460
Int. Cl.[4] H05B *6/64*
U.S. Cl. 219—8.5 **17 Claims**

1. A process for induction hardening through hardened chromium-molybdenum hot work die steel to achieve a uniform surface hardness and case depth without cracking or peeling through the case depth comprising the steps of induction heating to a uniform temperature about an upper critical temperature, cooling, and double tempering at temperatures below a lower critical temperature.

9. An apparatus for continuously induction heating a workpiece to obtain a hardened workpiece with minimum distortion, said apparatus comprising:

a frame;

a stationary bed supported by said frame;

means for supporting a workpiece in said apparatus;

a headstock drive assembly for engaging one end of a workpiece and rotating such workpiece;

an inductor head support assembly adapted to be supported by a workpiece;

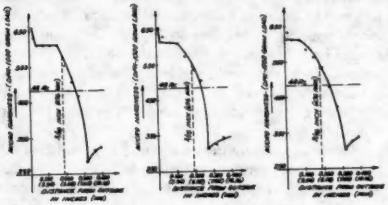
a carriage assembly slidably supported on said stationary bed for moving said inductor head support assembly in a line of movement along a workpiece;

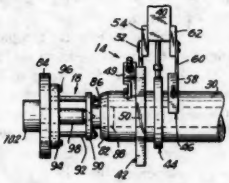
counterweight means pivotably connected to said inductor head support assembly by at least one intermediate connecting means, with said intermediate connecting means being pivotably connected to said carriage assembly, whereby said counterweight means has a sufficient weight to cause said inductor support assembly to apply a minimum force on said workpiece supporting said inductor head support assembly;

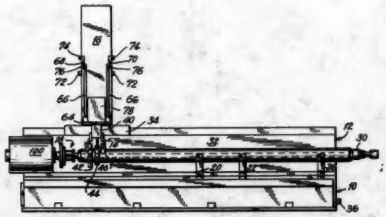
a drive means connected to said carriage assembly for driving said carriage assembly and inductor head support

assembly along the longitudinal length of said workpiece; and

at least one pivotable connection between said inductor head







support assembly and said carriage assembly for allowing free movement of said inductor head support assembly in a plane perpendicular to the line of movement of said inductor head support assembly along a workpiece.

4,599,503

MICROWAVE OVEN HAVING LOW-ENERGY DEFROST AND HIGH-ENERGY COOKING MODES

Shigeki Ueda, Yamato Kouriyama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jun. 3, 1985, Ser. No. 740,335

Claims priority, application Japan, Jun. 4, 1984, 59-114970

Int. Cl.[4] H05B *6/68*

U.S. Cl. 219—10.55 B **16 Claims**

1. A microwave oven comprising:

manually operated command entry means for the entry of a command to sequentially operate the oven in defrost and cooking modes;

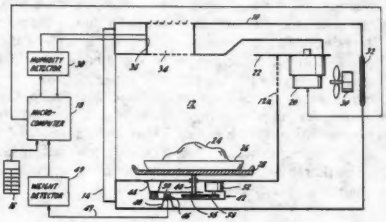
a heating chamber having table means on which an article to be heated is placed, wherein said article may either comprise a foodstuff exclusively or a combination of a container and a foodstuff contained therein;

microwave energy generating means for radiating microwave energy into said chamber for heating said article;

weight detecting means coupled to said table means for detecting the weight of said article;

means for detecting a substance emitted by said foodstuff as a result of heating; and

control means operable in response to the entry of said command for determining a first time period for said defrost mode as a function of the detected weight, causing said energy generating means to generate microwave energy of a lower level during said first time period, causing said energy generating means to switch to a higher energy level at the termination of said first time period, detecting when the emitted substance reaches a predeter-



mined amount, detecting a second time period elapsed between the termination of said first time period and the detection of said emitted substance reaching the predetermined amount, and determining a third time period as a function of said second time period and allowing said energy generating means to maintain said higher energy level in the cooking mode until the termination of said third time period.

4,599,504

INDUCTION HEATING APPARATUS WITH PROTECTION AGAINST POWER INTERRUPTION

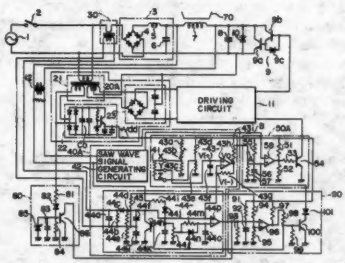
Susumu Ito, Nagoya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 31, 1984, Ser. No. 688,160

Claims priority, application Japan, Jul. 26, 1984, 59-156068

Int. Cl.[4] H05B *6/12, 6/06*

U.S. Cl. 219—10.77 **3 Claims**



1. An induction heating apparatus, which operates using power from an AC power source comprising:

an AC power supply line having one end connected to the AC power source;

rectifying means, connected to the other end of said AC power supply line, for rectifying a supplied AC voltage applied from the AC power source to a DC voltage output;

inverter means for converting the DC voltage output from said rectifying means into a high-frequency output;

heating coil means coupled to said inverter means for receiving said high-frequency output and for generating a high-frequency alternating magnetic field therefrom, induction heating of a load being performed by said alternating magnetic field;

voltage converting means coupled to said other end of said AC power supply line for converting the AC voltage supplied from the AC power source to a converted AC voltage;

voltage fluctuation detecting means, coupled to said voltage converting means, for receiving the converted AC voltage and for detecting variations in the level of the supplied AC voltage in accordance with the converted AC voltage, and providing a detection signal based on the converted AC voltage which assumes one state when the supplied AC voltage falls below a first predetermined threshold and assumes a second state upon lapse of a predetermined period after the supplied AC voltage rises above a second predetermined threshold; and

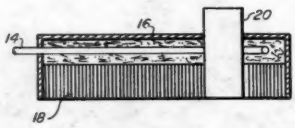
control means, coupled to said voltage fluctuation detecting means, for receiving the detection signal and providing a control signal which stops said inverter means for a period equal to the duration of said detection signal in said one state thereby protecting the induction heating apparatus against power interruption.

4,599,505

FLEXIBLE TRAILING SHIELD FOR WELDING REACTIVE METALS

William E. Lukens, and Robert DeNale, both of Annapolis, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 31, 1983, Ser. No. 480,653
Int. Cl.[4] B23K 9/16
U.S. Cl. 219—74 **3 Claims**



1. A flexible trailing shield for providing nonreactive gas shielding to arc welding operations comprising:

a housing, formed of interlocking transverse segments adapted to flexibly cover weld surfaces having varying configurations, and having a torch entrance port for slidably receiving a welding torch, said torch entrance port being defined by a conduit disposed partways from an end of said housing and extending from the base of said housing to a fixed distance above its top; and,

gas handling means for receiving nonreactive gas into said housing and uniformly dispersing the gas upon the weld surface.

4,599,506

VISUAL OBSERVATION OF WELDING OPERATION

Michael A. Burke, and Israel Stol, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 5, 1984, Ser. No. 678,523
Int. Cl.[4] B23K 9/10
U.S. Cl. 219—130.01 **12 Claims**

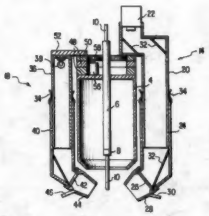
5. A visual observation system for monitoring a welding operation being performed in a welding region by a welding torch, the torch having a longitudinal axis and including a housing, said system comprising:

means defining a first closed light conducting channel having a first end directed toward the welding region and a second end remote from said first end, and composed of a first tubular member extending from said second end, a second tubular member extending from said first end and slidably mounted on said first member for permitting adjustment of the distance between said first and second ends, a rotatable support member mounted on the torch housing and supporting said first tubular member for rotating said first channel about the longitudinal axis of the torch, and light directing means within said channel for directing light from said first end to said second end, said means defining a channel being located adjacent the torch housing, being oriented such that said first and second ends are spaced apart in the direction of the longitudinal axis of the torch, and being dimensioned such that, in at least one direction transverse to the longitudinal axis of the torch, said channel does not project beyond the torch housing;

video image generating means mounted on said first tubular member at said second end of said channel for receiving light entering said channel via said first end in order to produce an image of the scene in front of said first end;

means constituted by a transparent plate removably disposed in, and blocking, said channel for protecting said image generating means against soiling by particles produced by the welding operation;

means for producing a flow of inert gas past the side of said transparent plate facing away from said image generating means for opposing the deposition of such particles on said plate, and composed of a first conical tubular member removably secured to said second tubular member at said first end of said channel and tapering away from said first end, and a gas inlet tube carried by said first conical tubular member and opening into the region enclosed by said first conical tubular member;



illuminating means supported by the torch and defining a second closed light conducting channel having a first end directed toward the welding region and a second end remote from said first end, said illuminating means comprising a third tubular member carried by said rotatable support member and extending from said second end of said second channel, a fourth tubular member extending from said first end and slidably mounted on said third tubular member for permitting adjustment of the distance between said first and second ends of said second channel, and a light source mounted in said second channel for illuminating the welding region;

a second transparent plate removably disposed in, and blocking, said second channel, at said first end thereof, for protecting said light source against soiling by such particles;

means for producing a flow of inert gas past the side of said second transparent plate facing away from said light source for opposing the deposition of such particles on said second plate, and composed of a second conical tubular member removably secured to said fourth tubular member at said first end of said second channel and tapering away from said first end, and a second gas inlet tube carried by said second conical tubular member and opening into the region enclosed by said second conical tubular member; and

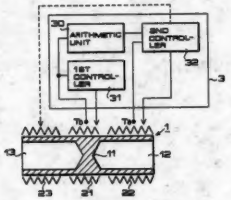
externally controllable rotation means mounted on the torch housing and operatively associated with said rotatable support member for rotating said first and second channels about the longitudinal axis of the torch.

4,599,507

TEMPERATURE CONTROL SYSTEM FOR A BLACKBODY FURNACE

Isao Hishikari, and Toshihiko Ide, both of Saitama, Japan, assignors to Chino Works, Ltd., Tokyo, Japan

Filed Mar. 2, 1982, Ser. No. 353,977
Claims priority, application Japan, Jul. 7, 1981, 56-105839; Jul. 23, 1981, 56-114455
Int. Cl.[4] H05B 1/02
U.S. Cl. 219—486 3 Claims



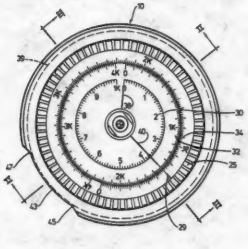
1. A blackbody furnace which comprises a main heater disposed adjacent a target portion of said blackbody furnace, at least one auxiliary heater disposed on at least one aperture of said blackbody furnace, and a control part for controlling said main heater and said at least one auxilliary heater in such manner that the temperature of said aperture of said blackbody furnace maintains a prescribed relationship with respect to the temperature of said target portion thereof, and further wherein said control part is a control part for controlling said at least one auxiliary heater in such a manner that the temperature of said aperture is the sum of the temperature of said target portion and the square of the temperature of said target portion in a cylindrical blackbody furnace when a single wave length is utilized.

4,599,508

CALORIE COUNTER

Terrace S. Smetaniuk, Mississauga, Canada, assignor to Peter Smetaniuk; Mark F. Voyska and Caroline Flanagan, all of Ontario, Canada

Filed Jun. 26, 1985, Ser. No. 749,057
Claims priority, application Canada, Dec. 10, 1984, 469722
Int. Cl.[4] G06C 27/00
U.S. Cl. 235—116 20 Claims



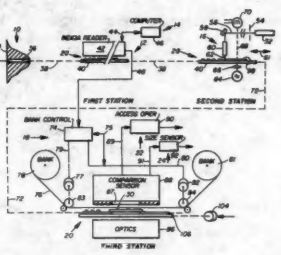
1. A calorie counter comprising
a housing having a base and a transparent cover connected to said base,
inner partition means located in said housing parallel to said cover and spaced apart from said cover, said inner partition means having at least two calorie counting scales provided thereon,
a first indicator means located between said cover and said inner partition for indicating on one of said scales the amount of calories contained in a food item consumed by the user of the counter;
second indicator means located between said cover and said inner partition means for indicating on the other of said scales the total amount of calories consumed by the user over a predetermined period of time,
gear means for operating both of said first and second indicator means at the same time,
a manually operated device mounted in said housing for turning and operating said gear means, and
means for returning said first indicator means to a zero point on said one of said two scales without affecting the position of said second indicator means.

4,599,509

ACCESS SECURITY CONTROL

Daniel Silverman, 5969 S. Birmingham Ave, Tulsa, Okla. 74105, and Everett A. Johnson, 15 S. Prospect Ave., Park Ridge, Ill. 60068

Division of Ser. No. 427,588, Sep. 29, 1982, Pat. No. 4,464,566, which is a continuation of Ser. No. 233,885, Feb. 12, 1981, Pat. No. 4,395,628, which is a continuation of Ser. No. 32,404, Apr. 23, 1979, Pat. No. 4,303,852, which is a continuation-in-part of Ser. No. 752,912, Dec. 21, 1976, Pat. No. 4,150,781, which is a continuation-in-part of Ser. No. 495,632, Aug. 8, 1974, Pat. No. 3,999,042, which is a continuation-in-part of Ser. No. 272,739, Jul. 18, 1972, Pat. No. 3,829,661, which is a continuation-in-part of Ser. No. 74,066, Sep. 21, 1970, Pat. No. 3,677,465. This application Aug. 6, 1984, Ser. No. 637,770
Int. Cl.[4] G06K 5/00
U.S. Cl. 235—382 11 Claims



1. An access security token adapted for use in authenticating access on presentation to a compatible system, the control token comprising
(1) an unique object having alterable access memory thereon:
(2) means on said object for storing in machine readable and writeable form a selected unique coded bit pattern providing said alterable access memory; and
(3) means on said object for storing in machine readable form an unique index for stored data to be accessed;
(4) each such control token having at least on such unique index and a corresponding unique coded bit pattern, both being stored in the system to be accessed.

4,599,510

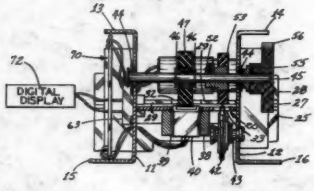
VIBRATION-MINIMIZING MAGNETIC CARD READER

Merlyn Barth, 729 W. Lockwood, Glendale, Mo. 63122, and Joseph Kosednar, 2030 Seven Rines Dr., Creve Coeur, Mo. 63141

Filed Jan. 5, 1984, Ser. No. 568,384
Int. Cl.[4] G06K 7/08
U.S. Cl. 235—449 5 Claims

1. A vibration-minimizing card reader for magnetically encoded cards, comprising a planar card tray adapted to support a magnetically encoded card for movement in a longitudi-

nal delivery path therealong, a magnetic reader head presented rigidly along said path and at substantially the level of said planar card tray, electronic circuitry so connected to said reader head as to verify data encoded longitudinally on such cards and, on such verification, to direct the performance of an electronic command, a transverse shaft in longitudinal registration with said reader head and having an axis at a level fixedly spaced from the plane of said card delivery tray, a radially deflectable rubber-like anvil roll so mounted on said shaft, immediately opposite to said reader head, as to permit idling rotation movements of the roll relative to the shaft, and means



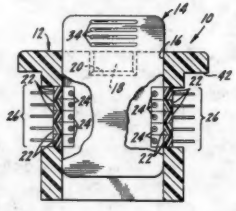
to engage and drive such encoded card along the longitudinal delivery path of said planar card tray, said means to engage and drive including a motor, means to engage it to said transverse shaft, a driving roll mounted on and secured to said shaft spaced axially from said anvil roll, and a driven roll projecting upward through and beyond the level of said planar card tray, said driving roll being of smaller diameter than and being characterized by greater resistance to deflection than said anvil roll, whereby the deflectance and damping characteristics of the rubber-like anvil roll, and its idling rotational movements, avoid vibrations in card reading and writing.

4,599,511

CARD READING SYSTEM

Bruno V. Stiller, 2840 Telegraph Rd., Bannockburn, Ill. 60015

Filed Mar. 22, 1984, Ser. No. 592,401
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—459 **7 Claims**



1. A system for generating a unique signal indicative of an identity carried by a card when the card is seated at a stationary card-reading position, comprising

a. a unitary card having a plurality of defined zones thereon, each zone having means to create an indication representative of a particular binary condition of said zone, said means to create comprising a hole through said card in said zone to permit passage of light therethrough or the absence of a hole through said card in said zone to prevent passage of light therethrough,

b. a receptacle for said card, said receptacle including a longitudinal internal slot to accomodate insertion of said card, and further including a plurality of card reading elements spaced such that when said card is inserted to a predetermined card-reading position within said receptacle, one reading element is positioned in registration with each said zone, and

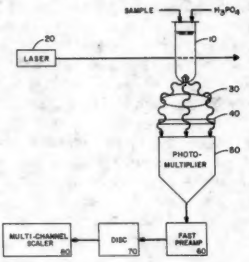
c. means to position said card at said predetermined card-reading position within said receptacle comprising an indented guide in said receptacle adjacent said slot and a corresponding protrusion extending outwardly from said card and engaging said guide when said card is inserted within said slot, said guide having a stop against which said protrusion seats to locate said card when inserted within said slot such that the combination of said guide and said protrusion limits the depth of insertion of said card within said slot and orients the position of said card.

4,599,512

LASER INDUCED PHOSPHORESCENCE URANIUM ANALYSIS

Bruce A. Bushaw, Kennewick, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 10, 1983, Ser. No. 503,130
Int. Cl.[4] G01N *21/64*
U.S. Cl. 250—253 **1 Claim**



1. A method for measuring uranium in aqueous solution comprising:

(a) adding phosphoric acid to a sample to convert any uranium present to a uranyl phosphate complex;

(b) irradiating the sample with a laser light pulse having a wavelength of 425 nanometers, a bandwidth of 10 nanometers, peak power of 50 kilowatts, and pulse duration of 5 nanoseconds;

(c) observing any resultant emissions at a wavelength of 520 nanometers at timed intervals of 10 microseconds duration during the time from 50 to 400 microseconds after the laser light pulse;

wherein the natural logarithm of the emission intensity observed in step (c) is plotted as a function of time yielding an intercept value which is directly proportional to uranium concentration independent of variations in absolute emission intensity which are caused by matrix quenching or by the temperature of the aqueous solution.

4,599,513

ENCLOSURE FOR SORTING RADIOACTIVE MATERIAL

Anthony J. Prisco, Beverly, and Alfred N. Johnson, Voorhees, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 10, 1984, Ser. No. 648,779
Int. Cl.[4] G21F *7/00*; G01T *1/167*
U.S. Cl. 250—336.1 **9 Claims**

1. An enclosure for sorting materials having relatively low radioactivity comprising

a floor, a plurality of side walls and a roof,

at least one radiation detector disposed in said enclosure,

said floor defining an aperture,

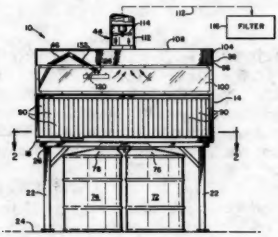
a closure for said aperture, said closure being connected to

said floor for movement between open and closed positions,

means for urging said closure toward its closed position,

means for receiving material which is discharged through said aperture, said means for receiving being disposed below said aperture so that material passing through said aperture is received by said means for receiving,

means coupled to said enclosure for withdrawing the air therefrom,



means for connecting said means for receiving to said means for withdrawing air from sid enclosure so that air can be withdrawn from said material receiving means, and

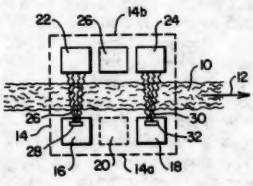
means defining a shield, and means for supporting said shield between said radiation detector and said means for receiving material so that said radiation detector is shielded from radiation from radioactive material in said means for receiving material.

4,599,514

ISOTOPIC RADIATION METHOD AND APPARATUS FOR MEASURING THE RESINOUS BINDER APPLIED TO A MAT OF GLASS FIBERS

Boong Y. Cho, Columbus, Ohio, assignor to AccuRay Corporation, Columbus, Ohio

Filed Dec. 13, 1982, Ser. No. 449,276
Int. Cl.[4] G01F *23/00*
U.S. Cl. 250—359.1 **8 Claims**



1. The method of measuring a traveling mat of glass fibers that have been coated with a resinous binder, so as to determine quantitatively the mass of binder per unit area of the mat, the method comprising

directing into the traveling mat gamma rays from a first radiation source comprising americium-241 isotope,

also directing into the traveling mat isotopic X-rays from a second radiation source comprising curium-244 isotope,

detecting the gamma rays from the traveling mat to produce a first response,

detecting the isotopic X-rays from the traveling mat to produce a second response, and

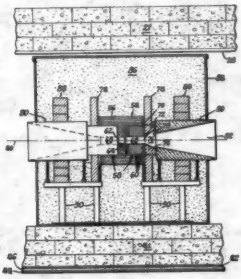
forming a combination of the first and second responses so as to produce a third response that is indicative of the mass of the binder and substantially independent of the mass of the glass fibers.

4,599,515

MODERATOR AND BEAM PORT ASSEMBLY FOR NEUTRON RADIOGRAPHY

William L. Whittemore, La Jolla, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed Jan. 20, 1984, Ser. No. 572,352
Int. Cl.[4] G01T *3/00*
U.S. Cl. 250—390 **16 Claims**



1. A moderator and beam port assembly for use with a source of fast neutrons to provide a beam of thermal neutrons directed generally along an axis toward an object position for neutron radiography, said assembly comprising

a moderator formed of solid hydrogenous material, said moderator having a source cavity lying on said axis,

means for supporting said source of fast neutrons adjacent said axis, said material having a high hydrogen density and substantially no neutron poisons and substantially surrounding said source cavity for thermalizing fast neutrons from said source within said moderator without substantial capture of the resulting thermal neutrons,

aperture means containing neutron poisons outside said moderator for capturing substantially all neutrons striking said aperture means having energies less than a predetermined epithermal energy and for forming and defining an aperture disposed about said axis outside said moderator, said moderator having an axial inner beam port cavity therein extending about said axis axially from said aperture substantially to said source cavity for permitting thermal neutrons to escape from said moderator through said aperture,

a collimator forming a generally axial collimating cavity symmetrically disposed about said axis and extending intermediate said aperture and said object position and diverging in straight lines in the direction of said object position, said collimator being composed of heavy metal and neutron poison and being axially spaced from said aperture,

first heavy metal shielding disposed axially between said collimator and said aperture for attenuating gamma rays arising from neutron capture in said moderator and said aperture means, said first heavy metal shielding having an axial opening providing substantially clear passage between said aperture and the proximal end of said collimating cavity,

neutron reflector means of hydrogenous material disposed about said moderator and said first heavy metal shielding for further moderating neutrons escaping from said moderator and reflecting neutrons back toward said moderator, and

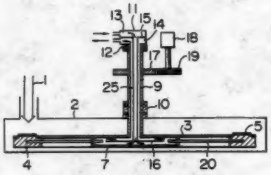
second heavy metal shielding means for attenuating gamma rays arising from neutron capture in said neutron reflector means.

4,599,516

SPECIMENS ROTATING DEVICE

Shunroku Taya, Mito; Takeshi Koike, Ibaraki, and Mitsuo Komatsu, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 4, 1983, Ser. No. 472,199
Claims priority, application Japan, Mar. 5, 1982, 57-33918
Int. Cl.[4] G21K 5/08
U.S. Cl. 250—443.1 10 Claims



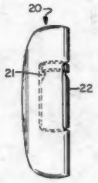
1. A device for rotating a specimen, comprising:
a cooling source comprising a first cooling fluid;
means for rotating a specimen around the cooling source; and
means for thermally connecting the specimen to the cooling source, the connecting means including a second working fluid which rotates around the cooling source together with the specimen so that centrifugal force is imparted to the working fluid, to thereby move the same toward the specimen in a direction substantially perpendicular to a rotating axis of the specimen, the specimen being cooled through heat transfer from the specimen to the cooling source in a direction opposite to said substantially perpendicular direction, based on evaporation of the working fluid moved toward the specimen and condensation of the evaporated working fluid moved toward the cooling source due to a difference in vapor pressure of the working fluid said means for thermally connecting the specimen to the cooling source.

4,599,517

DISPOSABLE RABBIT

Leroy C. Lewis, Idaho Falls, and David R. Trammell, Rigby, both of Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 12, 1983, Ser. No. 541,186
Int. Cl.[4] G21F 5/00
U.S. Cl. 250—506.1 5 Claims



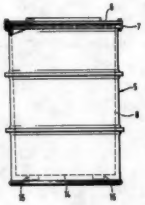
1. A method of managing the transfer of a sealed vessel containing a radioactive sample comprising the steps of:
placing a sealed vessel containing a radioactive sample in an opening in a disposable rabbit formed of solid aerated plastic which opening has been sized to receive and snuggly hold said vessel without additional packing material to prevent damage to said vessel during transfer and to permit removal of such vessel intact from the rabbit following transfer and said aerated plastic aerated such that dissolution of said rabbit in a solvent followed by evaporation of said solvent yields solid waste material having a significantly smaller volume than the original volume of said rabbit;
transferring said rabbit and said vessel to a desired location;
removing said vessel intact from said rabbit; and disposing of said rabbit.

4,599,518

TRANSPORT AND STORAGE CONTAINER ASSEMBLY FOR LOW AND MEDIUM LEVEL RADIOACTIVE WASTE AND METHOD OF FILLING THE SAME

Werner Schmidt, and Bernd D. Hahn, both of Springe, Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Jul. 2, 1984, Ser. No. 626,638
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1983, 3324293
Int. Cl.[4] G21F 5/00, 9/36
U.S. Cl. 250—507.1 14 Claims



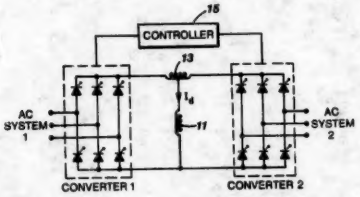
1. A transport and storage container assembly for weak and medium radioactive waste comprising:
a cup-shaped receptacle insert for receiving the radioactive waste directly therein;
a vessel defining a longitudinal axis and having an opening at its upper end for receiving said receptacle insert therein when the latter is lowered into the same along said axis;
a cover for closing said opening of said vessel after said receptacle has been placed therein;
said receptacle insert having a rim at its upper end defining the opening thereof through which the radioactive waste to be held therein is passed;
a manipulating ring mounted to said rim and extending in a radial direction therefrom, said manipulating ring including engaging means formed directly therein for facilitating engagement by a manipulating tool whereby said receptacle insert can be manipulated and placed in said vessel; and, centering means formed directly on said ring for contact engaging the inner wall surface of said vessel so as to cause said vessel and said insert to conjointly define a clear and unobstructed annular space between said inner wall surface of said vessel and the outer wall surface of said insert when the latter is lowered into and seated in said vessel;
said engaging means being a plurality of openings formed in said manipulating ring and communicating with said annular space so as to permit filling said space with a cast material after said insert is seated in said vessel; and,
supporting means disposed on the wall of said receptacle insert beneath and in spaced relationship of said manipulating ring for coacting with the rim of a second receptacle insert when the inserts are stacked one on top of the other.

4,599,519

SUPERCONDUCTING MAGNETIC ENERGY STORAGE FOR ASYNCHRONOUS ELECTRICAL SYSTEMS

Heinrich J. Boenig, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 16, 1984, Ser. No. 610,904
Int. Cl.[4] H02J 3/36
U.S. Cl. 307—22 **8 Claims**



1. An apparatus for providing superconducting magnetic energy storage for both a first and a second asynchronous electric system comprising:

(a) a first converter connected to and associated with the first asynchronous electrical system, said first converter having a first and a second conductor output;

(b) a second converter connected to and associated with the second asynchronous electrical system, said second converter having a first and a second conductor output, said second conductor output connected to said second conductor output of said first converter;

(c) a interphase reactor having a first and a second end terminal and a tapped terminal therebetween, said first end terminal connected to said first output conductor of said first converter and said second end terminal connected to said first output conductor of said second converter;

(d) a superconducting magnetic electric storage device connected between said tapped terminal of said interphase reactor and said second output conductors of said first and second converters; and

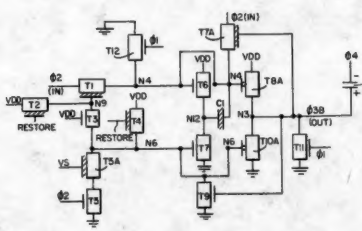
(e) means for controlling said first and second converters whereby either asynchronous electric system may charge said superconducting magnetic energy storage device and either asynchronous electrical system may receive the energy stored therein.

4,599,520

BOOSTED PHASE DRIVER

John A. Gabric, Essex Junction, and Edward F. O'Neil, Essex, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 31, 1984, Ser. No. 575,612
Int. Cl.[4] H03K 5/135, 5/02, 17/10, 17/687
U.S. Cl. 307—578 **13 Claims**



1. A boosted phase driver, comprising:

first and second transistors having respective first and second predetermined threshold, and gate, drain, and source electrodes, said source electrode of said first transistor being connected to an output node, said drain electrode of said first transistor being connected to a source of drain voltage and said gate electrode of said first transistor being connected to a first node;

a first charging means having a first side connected to said first node and a second side connected to the drain electrode of a third transistor for bootstrapping said first node to a potential at least substantially equal to the sum of said first predetermined threshold voltage and the voltage of said drain voltage source; and

said third transistor having a gate electrode connected to a second node and a source electrode connected to ground, wherein said third transistor controls the voltage level to said second side of said first charging means;

a fourth transistor having a drain electrode connected to said output node and a gate electrode connected to said second node and a source electrode connected to ground, wherein said fourth transistor controls the voltage level to said output node;

a second charging means connected between said output node and a second clock source;

isolation means for coupling an input signal from an input clock source to said first node and isolating said first node from said input signal when said first node is bootstrapped;

said second transistor having (1) a second predetermined threshold voltage being more negative for N-channel transistors or more positive for P-channel transistors than said first predetermined threshold voltage and (2) gate, drain, and source electrodes, said gate electrode being connected to said output node, said source electrode being connected to said bootstrapped first node, and said drain electrode being connected to said input clock source, said second transistor discharging said bootstrapped first node to a potential substantially equal to the voltage of said drain voltage source as the potential of said output node approaches the voltage of said drain voltage source;

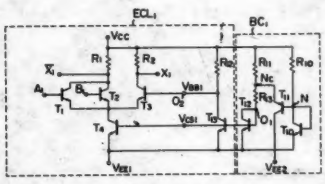
said discharging occurring prior to the boosting of said output node by the discharge of said second charging means by said second clock source.

4,599,521

BIAS CIRCUIT WITH VOLTAGE AND TEMPERATURE COMPENSATION FOR AN EMITTER COUPLED LOGIC CIRCUIT

Yasunori Kanai, Inagi; Eiji Sugiyama, and Kazumasa Nawata, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 27, 1982, Ser. No. 453,113
Claims priority, application Japan, Dec. 29, 1981, 56-214807
Int. Cl.[4] H03K 19/003, 19/086, 19/092, 19/098
U.S. Cl. 307—455 **8 Claims**



1. A bias circuit, operatively connected to a power supply, for providing a bias voltage to an output means, comprising:

a first transistor of a first conductivity type having an emitter, a base, and a collector operatively connected to the base;

a first reference-voltage terminal, operatively connected to the emitter of said first transistor, for providing a first reference-voltage;

a substantially constant-voltage node;

an output node, operatively connected to the base and collector of said first transistor and to the output means, for providing the bias voltage;

first impedance means, operatively connected between said substantially constant-voltage node and said output node, for providing a first impedance, the bias voltage being applied to the output means;

second impedance means, operatively connected between said first reference-voltage terminal and said substantially constant-voltage node;

a second transistor having a base, having a collector connected to the base and having an emitter operatively connected to said first reference-voltage terminal;

a PN junction element including a third transistor of a second conductivity type opposite to the first conductivity type, said third transistor having an emitter operatively connected to said substantially constant-voltage node, having a base operatively connected to the base and collector of said second transistor, and having a collector, the voltage at said substantially constant-voltage node being determined by said PN junction element and said second transistor; and

a second reference-voltage terminal operatively connected to the collector of said third transistor.

4,599,522

ANALOG SWITCH CIRCUIT HAVING OUTPUT OFFSET COMPENSATION CIRCUIT

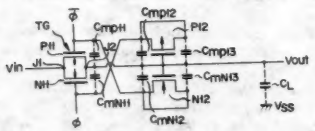
Kenji Matsuo, Yokohama, and Fuminari Tanaka, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 17, 1983, Ser. No. 552,791

Claims priority, application Japan, Nov. 22, 1982, 57-205044

Int. Cl.⁴ H03K *17/16, 17/687*

U.S. Cl. 307—576 **2 Claims**



1. An analog switch circuit responsive to complementary control signals, said analog switch circuit comprising:

a transmission gate comprising a first n channel MOS transistor and a first p channel MOS transistor which are connected in parallel to form first and second junctions, said first junction forming an input terminal and said second junction forming an output terminal, the gates of said first n and p channel MOS transistors each being connected to receive a respective one of said complementary control signals; and

an output voltage compensation circuit comprising a second n channel MOS transistor and a second p channel MOS transistor whose gates are connected to said output terminal of said transmission gate, the drain and source of said second n channel MOS transistor being connected to said gate of said first p channel MOS transistor, and the drain and source of said second p channel MOS transistor being connected to said gate of said first n channel MOS transistor.

4,599,523

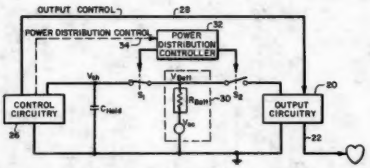
POWER PRIORITY SYSTEM

Benjamin D. Pless, and Lawrence J. Stotts, both of Lake Jackson, Tex., assignors to Intermedics, Inc., Freeport, Tex.

Filed Feb. 16, 1984, Ser. No. 580,898

Int. Cl.⁴ H02J *1/14;* **A61N** *1/378*

U.S. Cl. 307—31 **20 Claims**



1. A power control system, comprising;

first load means for performing a predefined function;

second load means;

power source means for powering the first and second load means; and

power distribution means for selectively connecting and disconnecting the first load means and the power source means, and for selectively connecting and disconnecting the second load means and the power source means;

the second load means including an energy storage means for storing power supplied by the power source means when the second load means is connected to the power source means;

the second load means further including a control means for controlling the operation of the first load means, the control means powered by the power source means when the second load means is connected to the power source means and powered by the energy storage means when the second load means is disconnected from the power source means; and

the power distribution means including means for comparing the voltage across the energy storage means with a predetermined reference voltage and switch means responsive thereto to connect the second load means to the power source means, so that the voltage powering the control means is maintained above a predetermined operating voltage.

4,599,524

POSITION-SENSING APPARATUS

David R. McMurtry, Wotton-Under-Edge, United Kingdom, assignor to Renishaw plc, Wotton-Under-Edge, England

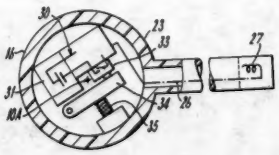
PCT No. PCT/GB83/00255, § 371 Date Jun. 8, 1984, § 102(e) Date Jun. 8, 1984, PCT Pub. No. WO84/01620, PCT Pub. Date Apr. 26, 1984

PCT Filed Oct. 11, 1983, Ser. No. 619,156

Claims priority, application United Kingdom, Oct. 11, 1982, 8228959

Int. Cl.⁴ G01B *7/02, 7/12*

U.S. Cl. 307—119 **10 Claims**



1. Probe for sensing the position of an object comprising:

means defining an electric circuit;

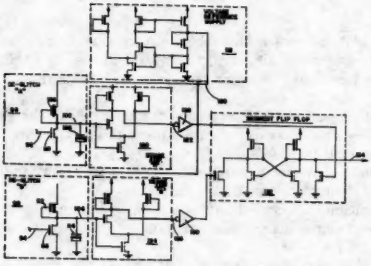
means for changing the state of the circuit responsive to the probe attaining a sensing relationship with the object;
an electric power supply means for energising said circuit;
switch means for connecting and disconnecting said power supply means to said circuit, characterised by;
movement-responsive means responsive to movement of said probe for acting on said switch means to establish a connection between said power supply and said circuit;
means responsive to said connection being established between said power supply means and said circuit for maintaining said connection following cessation of movement of said probe; and
means responsive to the changing of the state of said circuit for disestablishing said connection.

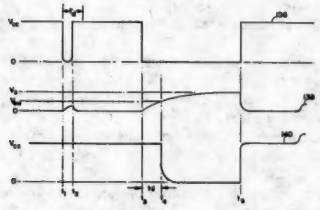
4,599,525

DE-GLITCH CIRCUITRY FOR VIDEO GAME MEMORIES

Chin-Pyng J. Tzeng, Albany, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 2, 1983, Ser. No. 463,093
Int. Cl.⁴ H03K *17/16, 17/284*
U.S. Cl. 307—234 **14 Claims**





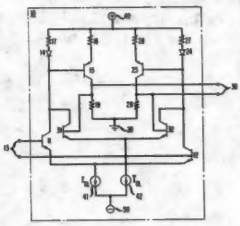
1. In a video game cartridge having first and second memory segments with an address segment select line, and a flip-flop coupled to said line for selecting between the segments, with set and reset inputs to said flip-flop for changing the state of the flip-flop, the cartridge having a common signal bus for addressing both the segments, and the cartridge having decoder circuitry for providing first and second segment select pulse signals in response to reception of predefined first and second segment select words on said bus, wherein the improvement comprises:
a first de-glitch circuit responsive to said first segment select signal, for producing a ramp de-glitch output signal which increases in amplitude during said first segment select pulse signal;
a first sense amplifier responsive to said first de-glitch output signal, for producing a first sense amplifier output signal on said set input to the flip-flop when said first de-glitch output signal exceeds a first predefined threshold switching level, so that said first sense amplifier output signal is provided only when said first segment select word has been present on said bus for a time duration greater than a first predefined signal duration;
a second de-glitch circuit responsive to said second segment select signal, for producing a second ramp de-glitch output signal which increases in amplitude during said second segment select pulse signal; and
a second sense amplifier responsive to said second de-glitch output signal, for producing a second sense amplifier output signal when said second de-glitch output signal exceeds a second predefined threshold switching level, so that said second sense amplifier output signal is produced only when said second segment select word has been present on said bus for a time duration greater than a second predefined signal duration.

4,599,526

CLOCKED LATCHING CIRCUIT

Robert M. Paski, Middletown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 13, 1983, Ser. No. 495,062
Int. Cl.⁴ H03K *5/01, 3/286*
U.S. Cl. 307—269 **6 Claims**



1. A digital latching circuit comprising
a quantizer having an input pair of emitter-coupled transistors of a first conductivity type connected to output transimpedance circuits, each of said output transimpedance circuits having an input and an output and including transistors of a second conductivity type, the quantizer being responsive to the state of an input signal applied to the input pair of producing from the output transimpedance circuits a quantized output signal,
a feedback pair of emitter-coupled transistors of the first conductivity type, each one of said feedback transistors being interposed between the output of a respective one of said transimpedance circuits and the input of that same transimpedance circuit for coupling output signals of that transimpedance circuit to the input of that same transimpedance circuit, and
a clock source for applying clock current pulses alternatively to the coupled emitter circuits of the input pair and of the feedback pair for alternatively enabling the quantizing of the state of the input signal and the latching of that quantized state.

4,599,527

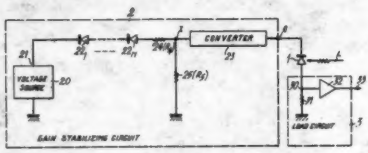
DEVICE FOR STABILIZING GAIN OF A PHOTOSENSITIVE AVALANCHE MEMBER

Didier M. Beaudet, and Pierre Nicole, both of Paris, France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Sep. 9, 1983, Ser. No. 530,647
Claims priority, application France, Sep. 14, 1982, 82 15479
Int. Cl.⁴ G05F *3/16*
U.S. Cl. 307—310 **7 Claims**

1. A device for stabilizing gain of a photosensitive avalanche member, comprising supply means for deriving a temperature-

stabilized voltage, at least one diode series-connected to the supply means, and voltage converting means for converting a



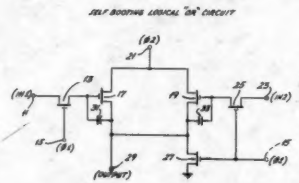
temperature-varying voltage derived from said diode into a bias voltage, said converting means being connected to apply said bias voltage to said photosensitive member.

4,599,528

SELF BOOTING LOGICAL OR CIRCUIT

James W. Redfield, Pottstown, Pa., assignor to Commodore Business Machines Inc., West Chester, Pa.

Filed Jan. 17, 1983, Ser. No. 458,436
Int. Cl.⁴ H03K *19/096*
U.S. Cl. 307—443 **9 Claims**



1. An OR circuit having first and second input nodes and an output node for performing a logical "OR" function to provide a signal on its output node in response to signals on its first and second input nodes, said OR circuit operating responsive to first and second non-overlapping timing pulses, comprising:

a first and second gate operated switching means each having an input electrode, and output electrode and a gate electrode wherein their output electrodes are each connected to said output node and their input electrodes are each connected to receive said second timing pulses whereby an OR function output is performed only in the presence of the second timing pulses by gating the second timing pulses through to the output node;

a first selective preconditioning and isolating means, connected between said first switching means gate electrode and said first input node, for selectively conditioning a charge on the gate electrode of said first switching means with a signal from said first input node and then selectively isolating said first switching means gate electrode from said first input node;

a second selective preconditioning and isolating means, connected between said second switching means gate electrode and said second input node, for selectively conditioning a charge on the gate electrode of said second switching means with a signal from said second input node and then selectively isolating said second switching means gate electrode from said second input node; and

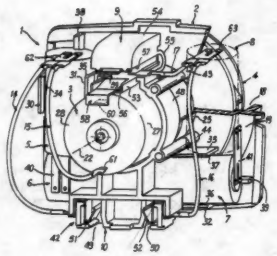
wherein said first and second selective preconditioning and isolating means are each connected to receive said first timing pulses wherein said preconditioning occurs only in the presence of a said first timing pulse and said isolating occurs only in the absence of a said first timing pulse.

4,599,529

FUNCTIONAL UNIT FOR A MOTORIZED ELECTRICAL APPLIANCE

Alain Verdier, Ste Foy les Lyon, and Marc Polly, Villeurbanne, both of France, assignors to Black & Decker Inc., Newark, Del.

Filed Aug. 31, 1984, Ser. No. 646,910
Claims priority, application France, Sep. 9, 1983, 83 11420
Int. Cl.⁴ H02K *7/00*
U.S. Cl. 310—50 **18 Claims**



1. A functional unit for an electrical appliance, comprising:

a support block having forward and rear faces, an aperture extending through said faces and defining an axis transverse to said faces;

an electric motor having a rotatable output shaft extending along said axis forwardly through said aperture to beyond said front face;

a driven member mounted on said shaft forwardly of said front face for rotation by said shaft;

means, connected to said block and extending rearwardly from said rear face, for mounting said motor to said rear face;

at least one rechargeable battery;

means, connected to said block and extending rearwardly from said rear face on opposite sides of said battery, for securing said battery to said rear face;

a ring-like piece secured to said block and encircling said motor;

said motor mounting means being disposed between said rear face and said ring-like piece, and said motor being a press fit through said ring-like piece into said motor mounting means;

switch means, mounted on said ring-like piece, for electrically connecting said battery to said motor to energize the latter; and

socket means, also mounted on said ring-like piece, for connection to an external source of electrical supply for recharging said battery;

whereby said functional unit is structurally independent of said electrical appliance and can be functionally tested before said functional unit is mounted in said electrical appliance.

4,599,530

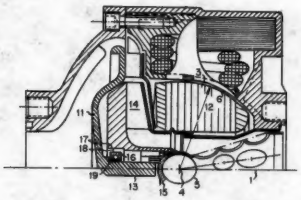
ROTOR SUPPORTED TO BE ABLE TO WOBBLE

Karsten Laing, 632 Marsat Ct., Chula Vista, Calif. 92011

Filed Nov. 2, 1984, Ser. No. 667,697
Int. Cl.⁴ H02K *5/16*
U.S. Cl. 310—90 **7 Claims**

1. A magnetic machine having a spherical gap for the magnetic flux between a stationary and a rotating member of the machine, where the rotating member of the machine exhibits a bearing formed from a convex sliding partner and a concave sliding partner, which allows wobbling motions, characterized in that besides the bearing consisting of the convex sliding partner (5) and the concave sliding partner (15) there is provided, arranged remote from it by an axial amount, a radial

bearing 16, 16*a* which forms with said member (13, 28) of the machine which is arranged concentrically with respect to the bearing (5, 15), a gap (18, 18*a*) which limits the angle of wobble



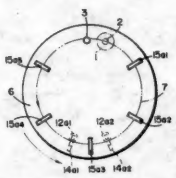
of the rotating member of the machine by preventing the angle from increasing once the rotating member contacts the radial bearing.

4,599,531

ROTATION DETECTOR

Takashi Kubo, Yokosuka, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 6, 1981, Ser. No. 232,176
Claims priority, application Japan, Feb. 8, 1980, 57-15020[U]; Feb. 29, 1980, 57-25803
Int. Cl.[4] H02K *21/12*
U.S. Cl. 310—111 **12 Claims**



1. A rotation detector for detecting at least one of the rotational speed and phase of a rotary member in respect to a stationary member as the former rotates about a rotational axis thereof, comprising:

at least one magnet member mounted on one of said rotary member and stationary member along a first circumferential path only thereof which is coaxial with the rotational axis of said rotary member;

at least one yoke member mounted on said one of said rotary member and stationary member that said at least one magnet member is mounted on and along said first circumferential path only;

at least one first core means, having a coil wound thereabout, mounted on the other of said rotary member and stationary member that said at least one magnet member is not mounted on and along a second circumferential path only thereof which is coaxial with said first circumferential path, for producing a first signal in response to only one of said at least one magnet member and said at least one yoke member during rotation of said rotary member; and

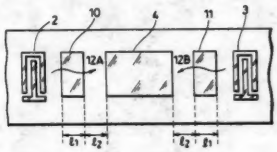
at least one second core means, each having a coil wound thereabout, mounted on the other of said rotary member and stationary member that said at least one magnet member is not mounted on and along said second circumferential path only, for producing a second signal in response to at least one of said at least one yoke member and said at least one magnet member during rotation of said rotary member.

4,599,532

SURFACE ACOUSTIC WAVE DEVICE WITH ANTI-REFLECTION ELECTRODE STRUCTURE

Takeshi Okamoto, and Shoichi Minagawa, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jul. 5, 1984, Ser. No. 627,876
Int. Cl.[4] H03H *9/42*
U.S. Cl. 310—313 D **4 Claims**



1. A surface acoustic wave device which comprises:

a piezoelectric substrate;

a pair of transducers provided on said piezoelectric substrate;

a center electrode provided in the center between said transducers; and

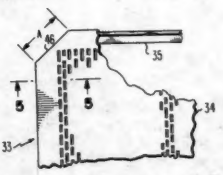
first and second shield electrodes provided between one of said transducers and said center electrode and between the other transducer and said center electrode, wherein the placement of said shield electrodes and central electrode is substantially represented by: $l_1=\lambda_0(1/12+n_1/2)$ and $l_2=\lambda_0(1/12+n_2/2)$ wherein l_1 is the width of said shield electrodes in the direction of surface acoustic wave propagation, l_2 is the distance from said shield electrodes to said center electrode, λ_0 is the wavelength of a surface acoustic wave at the central frequency, and n_1 and n_2 are whole numbers.

4,599,533

COLOR PICTURE TUBE HAVING SHADOW MASK FRAME WITH TRUNCATED CORNERS

Frank R. Ragland, Jr., Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed May 15, 1984, Ser. No. 610,483
Int. Cl.[4] H01J *29/80*
U.S. Cl. 313—407 **3 Claims**



1. In a color picture tube including an evacuated envelope having a rectangular faceplate panel with major and minor axes and wherein a central longitudinal axis of said tube passes through the center of said faceplate perpendicular to the major and minor axes, said faceplate panel including a shadow mask welded at various points including its corners to a peripheral frame mounted therein, said frame having a flange approximately paralleling the central longitudinal axis, and said shadow mask having a peripheral skirt approximately paralleling the central longitudinal axis, the improvement comprising

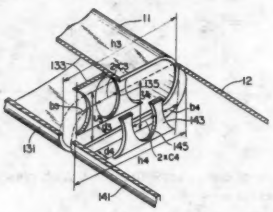
said shadow mask having truncated corners wherein the skirt portions at the corners are straight, flat and acutely angled with respect to both the major axis and the minor axis and are welded to said frame at approximately the centers of the straight and flat skirt portions.

4,599,534

ELECTRON GUN FOR COLOR PICTURE TUBE

Shoji Shirai, Koganei; Masaaki Yamauchi, Togane; Yoshiaki Iidaka, Chiba; Hiroshi Takano, Hachioji, and Masakazu Fukushima, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 22, 1984, Ser. No. 612,810
Claims priority, application Japan, May 23, 1983, 58-89132
Int. Cl.[4] H01J *29/62*
U.S. Cl. 313—414 17 Claims



1. An electron gun for a color picture tube, comprising:

electron beam generating means for generating three electron beams, said beams being substantially parallel to one another and directed to a fluorescent screen and being arranged so as to define one plane; and

a main lens for focusing said three electron beams on said fluorescent screen, said main lens including electrodes spaced apart from each other, said electrodes having:

(a) at least two envelopes surrounding said three electron beams and having opposing ends which confront each other; and

(b) electrode plates each disposed on a different one of said envelopes proximate to an opposing end so as to form confronting end faces in said envelopes, each of said electrode plates being shaped such that a single aperture is provided in said electrode plate so that said single aperture surrounds only the center path for the center electron beam among said three electron beams, said electrode plates having end portions configured so that the path for each outer electron beam is partly surrounded by a corresponding one of said end portions, at least one of said electrode plates being provided in one of said envelopes such that said electrode plate is recessed from the end of said one envelope confronting the other envelope.

4,599,535

DISPLAY TUBE OUTPUT ASSEMBLY AND METHOD OF MANUFACTURE

Peter L. Toch, Randolph, Mass., assignor to Raytheon Company, Lexington, Mass.

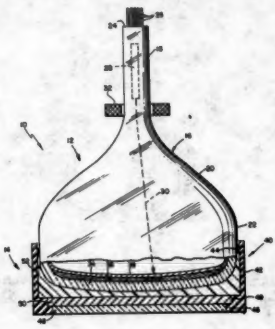
Filed Apr. 2, 1982, Ser. No. 364,746
Int. Cl.[4] H01J *29/89, 9/26;* H04N *5/72*
U.S. Cl. 313—478 10 Claims

1. An image display device comprising:

image producing means including an output surface having a first contour for producing an image and directing said image through said output surface;

image transmissive means aligned with said output surface for transmitting said image, said image transmissive means including a single rigid panel having a second contour different from said first contour and filter means disposed between said output surface and said rigid panel for selectively transmitting said image directed through said output surface; and

tubular means for supporting said image transmissive means in alignment with said output surface, said tubular means having one end portion secured about said output surface, an opposing end portion secured about said rigid panel



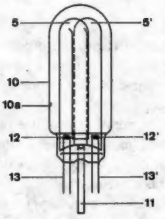
and an intermediate stepped portion secured about said filter means.

4,599,536

SINGLE-ENDED LOW-PRESSURE DISCHARGE LAMP, SUCH AS FLUORESCENT LAMP, AND METHOD OF ITS MANUFACTURE

Gerhard Steeger, and Josef Plischke, both of Augsburg, Fed. Rep. of Germany, assignors to Patent-Treuhand-Gesellschaft für elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Feb. 21, 1984, Ser. No. 581,826
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1983, 3307780
The portion of the term of this patent subsequent to Apr. 3, 2001, has been disclaimed.
Int. Cl.[4] H01J *1/92, 9/26*
U.S. Cl. 313—493 18 Claims



1. A single-ended low-pressure discharge lamp, particularly a single-ended fluorescent lamp, having

an inner base structure (1);

a base (14) receiving the inner base structure (1) of the lamp, and providing electrical terminals to an external socket;

an outer glass bulb (10) secured to the inner base structure (1) in gas-tight relation;

a fill comprising at least one of the materials of the group consisting of: gas; a metal vapor;

two pre-heatable electrodes (12, 12') secured to the inner base structure (1) and located inside the bulb (10); and

at least one inner glass tube (5, 5') located within the bulb (10), the inner glass tube being bent into U shape to define a connecting bend portion and two parallel elongated leg portions (6, 7; 6', 7') open at their free ends (8, 9),

a first (8) free end of one (6) of the leg portions surrounding one of the pre-heatable electrodes (12) and being melt-sealed thereinto in gas-tight relation, and

a second free end (9) of the other (7) leg portion defining a

communicating opening located within said inner base structure (1) with the interior of the bulb (10),

wherein, in accordance with the invention,

the inner base structure (1) comprises a unitary element, made of a glass compatible with and meltable to the bulb (10), having

a cup-shaped or dished portion (3) forming an outwardly extending flange or rim (3) concentric with the major axis of the bulb and melt-connected with said bulb (10);

an axially projecting depending end portion (2), extending towards the base (14), which, in cross-section, has the shape of an elongated oval,

the two pre-heatable electrodes (12, 12') and said first end (8) of the first leg (6) of the U-shaped tube (5) being melted into said depending end portion, and thereby secured to and supported within said inner base structure (1); and

a hollow, generally cylindrical intermediate portion (4) joining the dished portion (3) and the end portion (2) and forming with said dished portion and said end portion a single, unitary base structure.

4,599,537
IR LIGHT EMITTING APPARATUS WITH VISIBLE DETECTION MEANS

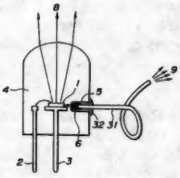
Shigeaki Yamashita, c/o Omron Tateisi Electronics Co., Shimokaiinji, Nagaokakyo-shi, Kyoto, Japan

Filed Apr. 27, 1983, Ser. No. 489,105

Claims priority, application Japan, Apr. 30, 1982, 57-63640[U]; May 31, 1982, 57-80131[U]

Int. Cl.⁴ H05B *33/02*; H01L *33/00*

U.S. Cl. 313—501 **18 Claims**



1. A light emitting apparatus capable of simultaneously emitting infrared rays and visible rays, comprising in combination:

a sealed infrared light emitting element which emits infrared light to the outside of said apparatus;

a fluorescent substance which converts infrared into visible light located in proximity to said infrared light emitting element; and

an optical fiber means connected with said fluorescent substance which guides the visible light rays produced by said fluorescent substance to the outside of said apparatus.

4,599,538
ELECTROLUMINESCENT DISPLAY DEVICE

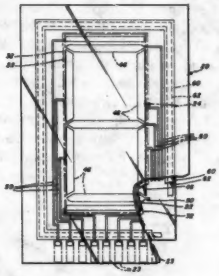
Henry T. Hidler, 35 Bayberry Rd., Danvers, Mass. 01923; Lawrence L. Hope, 402 Taylor Rd., Stow, Mass. 01775; Ernest A. Davey, 11 Esquire Dr., Peabody, Mass. 01960, and Martin P. Schrank, 25 Howe St., Ipswich, Mass. 01938

Continuation of Ser. No. 431,954, Sep. 30, 1982, abandoned. This application Jul. 18, 1985, Ser. No. 756,560

Int. Cl.⁴ H05B *33/04, 33/10*

U.S. Cl. 313—512 **12 Claims**

1. In an electroluminescent display device having a base substrate upon which multiple thin film layers are formed including electrically conductive thin film leads and a protective cover sheet disposed over the thin film layers, the improvement comprising hermetic seal means for joining the cover sheet over the base substrate including an electrically insulative thin film layer disposed over the conductive thin film leads and metallic solder means over the insulative thin film layer, the area of said substrate covered by said insulative thin film layer being greater than said metallic solder means, and said hermetic seal means not including a protective medium disposed between the base substrate and the cover sheet while providing a bond between the cover sheet and base substrate without causing shorting between leads.



4,599,539
RADIATION IMAGE STORAGE PANEL

Akio Ishizuka, Fujinomiya; Hisashi Yamazaki, and Kikuo Yamazaki, both of Kaisei, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

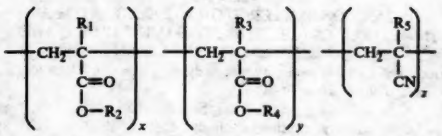
Filed May 15, 1984, Ser. No. 610,575

Claims priority, application Japan, May 16, 1983, 58-86228; May 4, 1984, 59-89614

Int. Cl.⁴ H05B *33/20*; H01J *31/52*

U.S. Cl. 313—525 **12 Claims**

1. A radiation image storage panel comprising a support and a phosphor layer provided thereon which comprises a binder and a stimulable phosphor dispersed therein, characterized in that said binder contains a (meth)acrylic copolymer in the amount of 5–100% by weight, which has repeating units represented by the formulas (I), (II) and (III):



(I) (II) (III)

in which each of R_1, R_3 and R_5 is independently a hydrogen atom or an alkyl group; R_2 is a group selected from those consisting of an alkyl group, a cycloalkyl group, an aryl group, a heterocyclic group and an aralkyl group; R_4 is a hydrogen atom or an alkyl group and $R_2 \neq R_4$; and x, y and z representing molar percents are numbers satisfying the conditions of $5 \leqq x \leqq 99$, $1 \leqq y+z \leqq 95$ and $x+y+z \geqq 90$.

4,599,540
HIGH INTENSITY ARC LAMP

Roy D. Roberts, Newark, Calif., assignor to ILC Technology, Inc., Sunnyvale, Calif.

Filed Jul. 16, 1984, Ser. No. 630,939

Int. Cl.⁴ H01J *17/20, 5/16*

U.S. Cl. 313—570 **8 Claims**

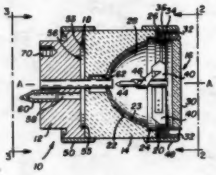
1. An arc lamp comprising:

a cylindrical base formed of an electrically and thermally conductive material;

a ceramic body comprising a cylinder into which a concave reflector surface has been formed about a central axis of

rotation of the body, said concave reflective surface having a discrete focal point about said central axis and opening about a first end of the body, the body including a second end for abutting with the cylindrical base;

a disk-shaped sapphire window mounted in a unitary circular flange having a U-shaped cross section, said flange being formed of an alloy of iron, nickel and cobalt having a coefficient of thermal expansion similar to that of ceramic, the window including chamfered edges whereby a junction of said edges and said flange may be brazed, the window being held in compression by said flange, the window and flange being sealingly mounted to the body about said first end whereby a sealed cavity is defined by said concave reflective surface and the window and flange;



at least one annular metallic back-up ring positioned intermediate to and secured to said window support flange and to the ceramic body, the back-up ring being formed of an alloy of iron, nickel and cobalt having a coefficient of thermal expansion similar to that of ceramic whereby said U-shaped flange remains securely affixed to said ceramic body during thermal expansion thereof; and

an anode and a cathode disposed about said central axis of rotation of the lamp, the anode being positioned within and secured to the base and including a tip extending into said concave reflective surface to coincide with said focal point, said cathode being disposed adjacent to said window and having a tip positioned less than two centimeters from said anode tip.

4,599,541

SCAN CONVERTER STORAGE TUBE WITH A MULTIPLE COLLECTOR STORAGE TARGET, AND METHOD OF OPERATION

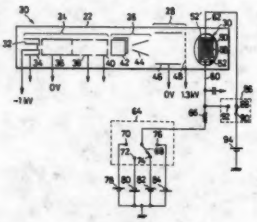
Takefumi Kato, Hinode, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1983, Ser. No. 553,301

Claims priority, application Japan, Dec. 3, 1982, 57-212375; Dec. 3, 1982, 57-212376; Dec. 3, 1982, 57-212377

Int. Cl.⁴ H01J *31/06, 31/58*

U.S. Cl. 315—8.51 **26 Claims**



1. A scan converter storage tube comprising:

(a) an evacuated envelope;

(b) an electron gun within the envelope for generating a beam of electrons;

(c) means for deflecting the electron beam; and

(d) a storage target having an effective region adapted to be bombarded by the electron beam, the storage target comprising a storage substrate having a storage surface, and a plurality of collector electrodes formed on the storage surface of the storage substrate and electrically insulated from each other by the storage substrate, the collector electrodes having respective groups of strips arranged substantially alternately and extending in parallel spaced relation with each other at least in the effective region of the storage target, the collector electrodes being adapted to be impressed with voltages and being effective to provide between themselves and the storage substrate potential differences dependent upon differences in the voltages being impressed upon each of said collector electrodes.

18. A method of operation for a scan converter storage tube which comprises:

(a) providing a scan converter storage tube with a storage target having at least two collector electrodes formed on a storage substrate and electrically insulated from each other, the collector electrodes having respective groups of strips arranged substantially alternately and in parallel spaced relation with one another at least in an effective region of the storage target which is to be bombarded by an electron beam, the two collector electrodes being adapted to be impressed with voltages and being effective to provide between themselves and the target substrate potential differences dependent upon differences in the voltages impressed upon each of said two collector electrodes;

(b) creating a potential difference between the collector electrodes of the storage target by applying different voltages thereto; and

(c) bombarding the effective region of the storage target with an electron beam deflected in accordance with an input signal to be written thereon, in the presence of the potential difference between the collector electrodes.

4,599,542

LINEAR BEAM TUBES

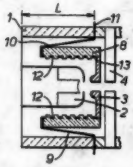
Robin C. M. King, Ongar; Maurice Esterson, Chelmsford, and John Clarke, Malvern Link, all of England, assignors to English Electric Valve Company Limited, Chelmsford and The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, both of, England

Filed Jul. 26, 1984, Ser. No. 634,484

Claims priority, application United Kingdom, Jul. 30, 1983, 8320613

Int. Cl.⁴ H01J *29/96, 7/44, 1/96*

U.S. Cl. 315—59 **15 Claims**



1. An electron beam tube comprising an electron gun having at one end thereof a cathode and at the other end thereof an anode, said anode being mounted adjacent to but isolated from an end wall of a structure downstream of said gun and wherein said anode is supported by means of folded mounting means comprised of a first part extending back from said anode towards the cathode end of said gun and a second part extending forward from the end of said first part remote from said anode towards said end wall, one of said two parts being of insulating material and having provided on a surface thereof a limiting impedance which is electrically in series in a path between said anode and an external termination which in oper-

ation may be grounded whereby to permit said anode to tend to charge towards cathode potential if an anode to cathode arc occurs.

4,599,543

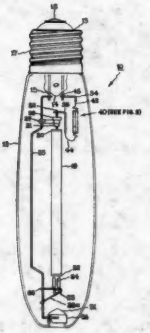
TIME FUSE FOR HIGH PRESSURE SODIUM LAMPS

Jack M. Strok, Garrettsville, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 542,246, Oct. 14, 1983, abandoned. This application Jan. 27, 1986, Ser. No. 822,931

Int. Cl.[4] H01J *7/44, 17/34, 19/78, 29/96*

U.S. Cl. 315—73 **7 Claims**



1. In a high pressure vapor lamp having:

an outer vitreous envelope including a pair of sealed lead-in conductors, an arc tube supported within said outer envelope and having one of its ends connected to one of said lead-in conductors, the improvement comprising:

a time fuse device including an electrically conductive fusible element supported within a housing and serially connected between the other end of said arc tube and the other of said lead-in conductors, said fusible element having a time fuse characteristic established by preselected dimensions and material adapting it to rupture within a predetermined time duration corresponding to the anticipated life expectancy of the lamp.

4,599,544

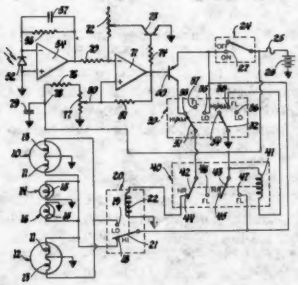
VEHICLE HEADLAMP BEAM CONTROL

Robert A. Martin, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed May 24, 1984, Ser. No. 613,459

Int. Cl.[4] B60Q *1/02*

U.S. Cl. 315—83 **3 Claims**



1. Control apparatus for a motor vehicle headlamp system including selectable upper and lower beam generators, the control apparatus comprising:

first means effective to generate a signal voltage varying with the sensed intensity of light from the headlamps of oncoming vehicles;

second means comprising a comparator with a first input at a constant predetermined voltage and a second input connected through a first resistor to the output of the first means, the second means further comprising a second resistor connectible to ground by switch means controlled by the output of the comparator to connect the second resistor, and thus reduce the portion of the signal voltage provided to the second input of the comparator, when said portion falls below the constant predetermined voltage and disconnect the second resistor, and thus provide the full signal voltage to the second input of the comparator, when the portion exceeds the constant predetermined voltage, the second resistor having a resistance variably controlled by the vehicle operator; and

third means effective, in response to the comparator output, to select the upper or lower beam generator, respectively, when the perceived light intensity from oncoming vehicles, as embodied in the voltage input to the second input of the comparator, falls below or exceeds, respectively, that corresponding to the constant predetermined voltage, whereby the apparatus exhibits hysteresis in switching between upper and lower beam generators but the lower-to-upper switching illumination level remains constant regardless of operator induced variations in the upper-to-lower switching illumination level.

4,599,545

SERVOMOTOR CONTROLLER

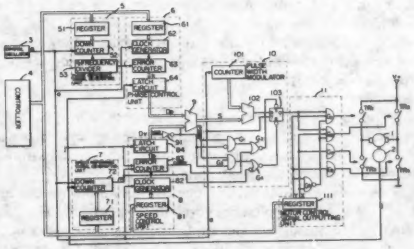
Etsuzo Moriki, Kasai; Yoshifumi Miyazaki, Hyogo, and Torahiko Nonoue, Kakogawa, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Dec. 14, 1984, Ser. No. 681,781

Claims priority, application Japan, May 15, 1984, 59-98279

Int. Cl.[4] G05B *5/00*

U.S. Cl. 318—314 **14 Claims**



1. A servomotor controller of a phase locked loop type comprising:

a rotation detector arranged in association with said servomotor for outputting a phase signal corresponding to the rotation of said servomotor;

a phase reference signal generating unit having a register means for storing data specifying a pulse cycle period of said phase reference signal;

a phase control unit for detecting a phase difference between said phase reference signal and said output signal of said rotation detector and for outputting the detection results in numerical values;

a speed reference signal generating unit having a registering means for storing data specifying a pulse width of said speed reference signal;

a speed control unit which uses said speed reference signal for detecting the cycle period of said output signal of said

rotation detector and for outputting the detection results in numerical values;

a full adder for adding the outputs of said phase control unit and said speed control unit and for providing an output corresponding thereto;

a signal converting unit for outputting a motor speed control signal corresponding to said output of said full adder;

wherein said phase control unit includes a register means for storing data specifying a detectable range of phase difference with respect to the whole variation width of an output value of said phase control unit;

wherein said speed control unit includes a register means for storing data specifying a detectable range of a cycle period with respect to the whole variation width of the output value of said speed control unit;

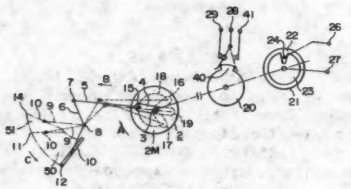
and wherein said controller further comprises a controller means for providing signals for setting said register means of said phase and speed control units.

4,599,546

WIPER DEVICE

Keiichi Uemura, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 26, 1984, Ser. No. 686,408
Int. Cl.[4] H02P 1/04
U.S. Cl. 318—443 **7 Claims**



1. A wiper device having a wiper blade adapted to be reciprocally driven by the torque of a motor to wipe and clean a predetermined wiping area of a window surface, said wiper blade being adapted to be moved out of said wiping area to a final rest position when wiping operation is unnecessary, said wiper device comprising:

a reversible motor;

a wiper unit incorporating said reversible motor;

an output shaft of said wiper unit driven by said motor and adapted to rotate forwardly and rearwardly within an angular range not greater than 360°;

a wiper blade operatively connected to said output shaft and adapted to be driven reciprocally by said output shaft;

first switch means for detecting the rotation of said output shaft and having an operation which is adapted to be reversed at at least one reversing position of the reciprocal motion of said wiper blade;

second switch means adapted to detect the rotation of said output shaft of said wiper unit and to operate when said wiper blade reaches adjacent said final rest position;

a manually operable wiper switch having switching positions to emit instructions for commencement and stoppage of the wiping operation, respectively; and

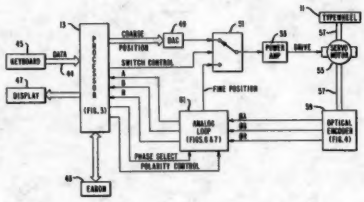
motor controlling switch means operable in response to a wiper-commencement instruction of said manually-operable wiper switch to cause said motor to rotate in one of two directions, said one direction being dependent on the operation of said first switch means, said motor controlling switch means being also responsive to a wiper-stoppage instruction of said manually-operable wiper switch to allow the operation of said motor to be continued in said one direction irrespective of the operation of said first switch means, said motor controlling switch means being further operative to stop said motor when said second switch means detects arrival of said wiper blade adjacent to said final rest position.

4,599,547

FINE-COARSE POSITIONING CONTROL SYSTEM WITH EASY ADJUSTMENT

Benedict C. M. Ho, Waterloo, Canada, assignor to NCR Canada Ltd-NCR Canada LTEE, Mississauga, Canada

Filed Oct. 23, 1984, Ser. No. 663,785
Int. Cl.[4] G05B 11/18
U.S. Cl. 318—594 **20 Claims**



1. A typewheel servo control system comprising:

a typewheel having characters spaced around its periphery;

positioning means being responsive to a coarse position signal for a given character for positioning said typewheel to a preselected coarse position for said given character and being further responsive to a fine position signal for said given character for positioning said typewheel to a desired fine position for said given character;

position sensing means coupled to said positioning means for developing a reference signal representative of a reference position of said typewheel and for further developing first and second signals having zero crossings representative of different coarse positions of said typewheel;

a memory for storing adjustment information for a plurality of desired coarse positions and associated fine positions for said characters on said typewheel, each desired fine position being located at an associated one of said coarse positions or between two adjacent associated said coarse positions;

processing means responsive to a command signal for a given character, adjustment information for a desired coarse position and associated fine position for said given character, said reference signal, and said first and second signals for selectively developing said coarse position signal for said given character and first, second and third control signals, said third control signal being developed after said preselected coarse position has been reached;

first switching means responsive to said first and second signals and to the first and second control signals for developing said fine position signal for said given character; and

second switching means being responsive to a first logical state of said third control signal for passing said coarse position signal for said given character to said positioning means and being responsive to a second logical state of said third control signal for passing said fine position signal for said given character to said positioning means.

4,599,548

PWM CONTROLLER FOR AN ELECTRICAL LOAD

Warren J. Schultz, Tempe, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

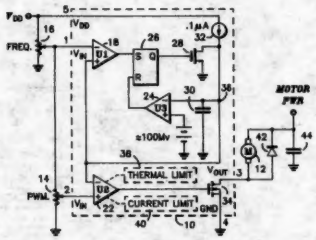
Filed Mar. 18, 1985, Ser. No. 713,129
Int. Cl.[4] G05B 11/28; H02P 1/22
U.S. Cl. 318—599 **14 Claims**

1. A pulse width modulation controller comprising:

first, second and third comparators having respective invert-

ing and non-inverting inputs and an output thereof, said inverting input of said first comparator and said non-inverting input of said second comparator defining first and second input voltage lines respectively, said non-inverting input of said first comparator being coupled to said inverting inputs of said second and third comparators defining a current node and said non-inverting input of said third comparator being coupled to an offset voltage source with respect to a reference voltage line;

latching means having set, reset and output terminals thereof, said set and reset terminals being coupled to said output of said first and third comparators respectively.



first and second switching means having respective first and second current carrying electrodes and a control electrode thereof, said latching means output terminal and said output of said second comparator being coupled to said control electrodes of said first and second switching means respectively, each having said first current carrying electrodes thereof coupled to said reference voltage line and said second current carrying electrodes coupled to said current node and an output voltage line respectively;

a current source coupling a supply voltage line to said current node; and

a capacitor coupling said current node to said reference voltage line.

4,599,549

METHOD AND APPARATUS FOR CONTROLLING PWM INVERTERS

Nobuyoshi Mutoh, Hitachi; Keijiro Sakai, Hitachiota; Akiteru Ueda, Ibaraki; Akira Ishibashi, Tokyo, and Ikuo Okajima, Yachiyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 16, 1985, Ser. No. 723,646

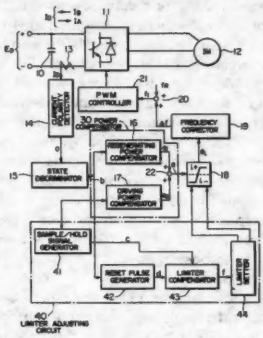
Claims priority, application Japan, Apr. 16, 1984, 59-74984; Sep. 14, 1984, 59-191608

Int. Cl.[4] H02P *5/40*

U.S. Cl. 318—798 **10 Claims**

1. A method for controlling a PWM inverter circuit responsive to a pulse width modulated signal resulting from comparison of a carrier wave signal with a sine wave modulation signal having a frequency proportional to a frequency setting signal to drive an AC motor, said method comprising the steps of:

detecting positive and negative components of a DC current flowing in the input side of said PWM inverter circuit; and



correcting said frequency setting signal such that said positive and negative components occur alternately within one period of said carrier wave signal.

4,599,550

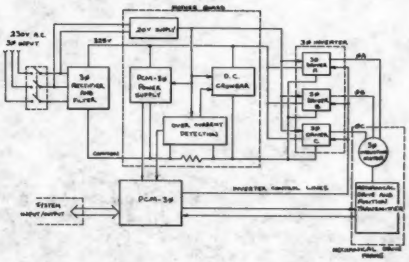
DIGITAL GENERATION OF 3-PHASE PWM WAVEFORMS FOR VARIABLE SPEED CONTROL OF INDUCTION MOTOR

John W. Robertson, Jr., Willowick, and Stuart B. Siegel, Willoughby, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 375,796, May 7, 1982, abandoned. This application Apr. 2, 1985, Ser. No. 718,690

Int. Cl.[4] H02P *5/40*

U.S. Cl. 318—811 **2 Claims**



1. A device for generating three-phase, pulse width modulated waveforms for a three-phase, variable speed, constant torque, induction motor controller for a high torque servo positioner operated by a three-phase induction motor comprising:

microprocessor means programmed for various control functions including initialization, a main task, pulse width modulated waveform generation, and interrupt processing, the main task control function comprising (i) storing a converted analog signal, (ii) checking limits of motor position and when such limits are reached, setting desired driving frequency to zero, (iii) checking a feedback signal which is indicative of the motor servo position, (iv) ramping actual driving frequency to meet the desired driving frequency, and (v) calculating desired driving frequency according to at least one algorithm;

a read only memory connected to said microprocessor means for containing the programming thereof and for

containing a pluraility of tables each corresponding to a desired driving frequency;

an analog to digital converter connected to said microprocessor means for receiving analog control signals, said analog control signals corresponding to gain, set point, feedback, and deadband signals for said servo positioner, said converter operable to convert at least one of said analog control signals at a time into said converted analog signal readable by said microprocessor means;

a plurality of timers connected to said microprocessor means for receiving information from one of said tables in said memory to generate timer outputs corresponding to 90° segments of said three-phase, pulse width modulated waveforms for said induction motor controller;

a latch responsive to said microprocessor means for generating a plurality of inversion control signals in response to said microprocessor means;

a pulse width modulated waveform conditioner connected between said latch and said plurality of timers and responsive to said plurality of inversion control signals to pass said timer outputs to said induction motor controller in an inverted or noninverted state; and

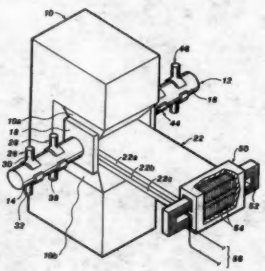
at least one additional timer connected to said microprocessor means for generating an interrupt signal upon occurrence of an undesirable condition for the motor, said interrupt signal applied to said microprocessor means.

4,599,551

THERMOACOUSTIC MAGNETOHYDRODYNAMIC ELECTRICAL GENERATOR

John C. Wheatley; Gregory W. Swift, both of Los Alamos, and Albert Migliori, Santa Fe, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 16, 1984, Ser. No. 672,228
Int. Cl.⁴ H02N *4/02*
U.S. Cl. 322—2 R **7 Claims**



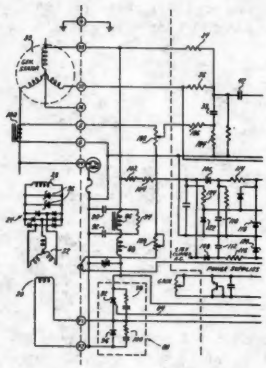
1. A thermoacoustic magnetohydrodynamic electrical generator comprising a magnet having a magnetic field, an elongate hollow housing containing an electrically conductive liquid and a thermoacoustic structure positioned in said liquid, heat exchange means thermally connected to said thermoacoustic structure for inducing said liquid to oscillate at an acoustic resonant frequency within said housing, said housing being positioned in said magnetic field and oriented such that the direction of said magnetic field and the direction of oscillatory motion of said liquid are substantially orthogonal to one another, first and second electrical conductor means connected to said liquid on opposite sides of said housing along an axis which is substantially orthogonal to both the direction of said magnetic field and the direction of oscillatory motion of said liquid, whereby an alternating current output signal is generated in said conductor means at a frequency corresponding to the frequency of said oscillatory motion of said liquid.

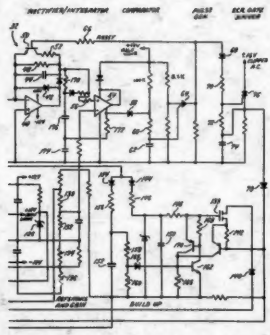
4,599,552

GENERATOR VOLTAGE REGULATOR

Graham R. Phillips, St. Louis, and Vietson M. Nguyen, Florissant, both of Mo., assignors to Century Electric, Inc., St. Louis, Mo.

Filed Sep. 7, 1984, Ser. No. 648,721
Int. Cl.⁴ H02J *7/14*
U.S. Cl. 322—28 **19 Claims**





1. A voltage regulator for regulating the output voltage of an A-C generator, said generator having a field, the voltage regulator comprising:

means to produce a voltage to excite the field,

means to sense the A-C generator output voltage,

means to integrate one-half cycle of the A-C generator voltage output,

means to generate a reference voltage,

means to compare said integrated voltage with the reference voltage,

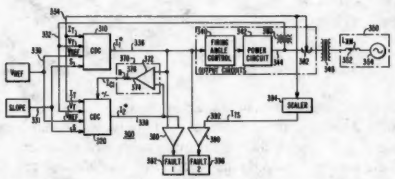
means to enable said comparator means at the end of the one-half cycle during which said integration means integrates the output voltage, and

means to regulate the field exciter voltage producing means in response to said voltage comparator means to thereby regulate the field strength and the generator output voltage.

4,599,553
MALFUNCTION DETECTOR FOR STATIC VAR CONTROLLERS

Michael B. Brennen, Pittsburgh, and Miklos Sarkozi, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 28, 1985, Ser. No. 707,000
Int. Cl.[4] G05F *1/70*
U.S. Cl. 323—205 **7 Claims**



1. A VAR generator for providing reactive compensation output to an electrical system, comprising:

reactance means for providing reactive compensation, the output thereof being linearly responsive to a first linearized control signal;

transducer means for monitoring the output of the VAR generator and producing a feedback signal that is proportional to the reactive compensation provided;

reference signal means for providing a reference signal related to the reactive compensation required;

director control means for providing to the reactance means the first linearized control signal in response to the reference signal and the feedback signal;

tracker control means substantially identical to the director control means for providing a second linearized control signal in response to the reference signal and the feedback signal;

equalizing means for determining the difference between the first and second linearized control signals and providing limited compensation of the second linearized control signal, the amount of compensation being limited to that which counters the difference between the first linearized control signal and the second linearized control signal caused by the offset and component tolerances of the director control and the tracker control means whereby the second linearized control signal is made substantially equal to and tracks the first linearized control signal;

first comparator means for comparing the compensated second linearized control signal with the first linearized control signal, the first comparator means having an output whenever the first linearized control signal and compensated second linearized control signal are not substantially equal to one another, the output thereof indicating that a fault has occurred in one of the two control means; and

second comparator means for comparing the first linearized control signal with the output of the reactance means, the second comparator means having an output whenever the first linearized control signal and the output signal are not substantially equal to one another, the output thereof indicating that a fault has occurred in the reactance means.

4,599,554
VERTICAL MOSFET WITH CURRENT MONITOR UTILIZING COMMON DRAIN CURRENT MIRROR

Jeffrey M. Jaycox, Allen, and Dorman C. Pitzer, Plano, both of Tex., assignors to Texet Corportion, Allen, Tex.

Filed Dec. 10, 1984, Ser. No. 679,939
Int. Cl.[4] G05F *3/26*
U.S. Cl. 323—317 **6 Claims**

1. In a controlled current circuit, the improvement comprising a monolithic semi-conductor component performing the same function with substantially the same characteristics as a vertical metal/oxide/semi-conductor field effect transistor (MOSFET) and including an additional terminal providing an output voltage related to the current flowing in the device, consisting essentially of:

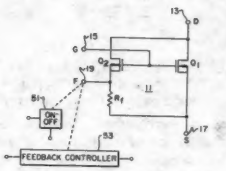
a. a drain terminal;

b. a gate terminal;

c. at least one source terminal;

d. a feedback terminal having voltage (Vf);

e. a first vertical MOSFET having an intrinsic source, an intrinsic body, an intrinsic gate and an intrinsic drain and having its said intrinsic source connected to one said component source terminal, having its said intrinsic body connected to its said intrinsic source, having its said intrinsic gate connected to said component gate terminal, and having its said instrinsic drain connected to said component drain terminal;



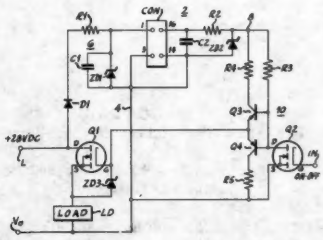
f. a second vertical MOSFET formed in the same substrate as the first MOSFET so that its intrinsic drain is formed by the same semi-conductor material as that of the first, making both drains necessarily and inseparably connected; a second MOSFET body connected to its intrinsic source, its intrinsic gate connected to said component gate terminal, and its intrinsic source connected to a first resistor (Rf);

g. said first resistor (Rf) being serially connected to said second MOSFET intrinsic source, with the junction of said resistor and said source of said second MOSFET being connected with said component feedback terminal, having the opposite node of said resistor connected to a said component source terminal.

4,599,555
SOLID STATE DC POWER CONTROL SYSTEM

Michael A. Damiano, Germantown; Dennis M. Kramer, Brookfield, and Richard F. Schmerda, Oak Creek, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 22, 1985, Ser. No. 693,700
Int. Cl.[4] H03K *17/687*
U.S. Cl. 323—351 **7 Claims**



1. A solid state DC power control system comprising:

a DC power supply having a high voltage side and a low voltage side and predetermined power supply voltage;

a solid state switching device having high side and low side power terminals and a control terminal requiring a control voltage that is a predetermined amount higher than its low

side voltage and being connected at its high side to said high voltage side and at its low side through a load to said low voltage side of said power supply to control energization of said load;

voltage increasing means energized from said power supply independently of any input signal for providing a substantially constant control supply voltage significantly higher in value than said power supply voltage;

input control means responsive to a logic level input signal for applying said control voltage on or off said control terminal thereby to render said switching device conducting or non-conducting;

and means regulating the magnitude of said control voltage applied across said control terminal and said low side power terminal so as to limit it to or maintain it at a value sufficient to maintain said switching device conducting despite variation in said low side voltage upon energization of said load.

4,599,556

METHOD FOR DETECTING A DISTURBANCE ALONG A CONDUCTOR IN AN ELECTRICITY-DISTRIBUTION SYSTEM OF THE GRID TYPE

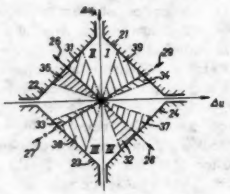
Otto Lanz, Niederrohrdorf, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jan. 12, 1983, Ser. No. 457,367

Claims priority, application Switzerland, Jan. 15, 1982, 230/82

Int. Cl.⁴ H02H *3/40*; G01R *31/08*

U.S. Cl. 324—52 **11 Claims**



1. Apparatus for detecting a disturbance along a conductor in an electrical power distribution system; comprising:

a pair of transformers respectively generating input signals corresponding to abrupt changes in the current and voltage of the conductor;

a pair of filters for respectively removing steady-state, system-frequency components from said input signals;

means for essentially cancelling any relative phase difference between said input signals;

means for comparing the polarities of said input signals and for combining said signals to form a combination signal; and

means for comparing the combination signal with a limit value.

4,599,557

LOGIC PROBE

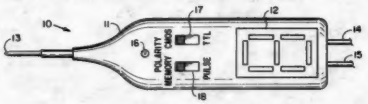
Victor L. Cestaro, 19 Allegheny Dr. W., Farmingville, N.Y. 11738

Filed Jun. 30, 1983, Ser. No. 509,342

Int. Cl.⁴ G01R *19/14*

U.S. Cl. 324—133 **15 Claims**

1. Test equipment for determining the logic state of a digital circuit comprising: electrically conductive probe means for contacting a circuit to determine the voltage or logic state of the circuit; logic "1" detector means having a probe input connected to said probe means, a threshold input, and an output for producing a signal when the voltage at said probe input exceeds the voltage at said threshold input; first gate means responsive to an output signal from said logic "1" detector means for producing a logic "1" signal; logic "0" detector means having a probe input connected to said probe means, a threshold input, and an output for producing a signal when the voltage at said probe input falls below the voltage at said threshold input; second gate means responsive to an output signal from said logic "0" detector means for producing a logic "0" signal; means for setting voltage levels at the probe and



threshold inputs of said detector means for testing TTL circuitry and for setting different voltage levels at said inputs for testing CMOS circuitry; means for selecting which voltage levels are set at said inputs of said detector means; and display means connected to said first and second gate means and responsive to a logic signal therefrom for indicating the logic state of the circuit under test.

4,599,558

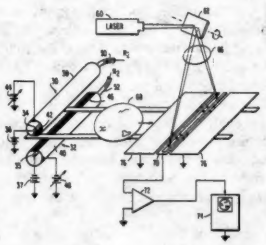
PHOTOVOLTAIC IMAGING FOR LARGE AREA SEMICONDUCTORS

Anthony J. Castellano, Jr., New Fairfield, Conn.; Thomas H. DiStefano, Bronxville, and Robert S. Olyha, Jr., Yonkers, both of N.Y., assignors to IBM, N.Y.

Filed Dec. 14, 1983, Ser. No. 561,364

Int. Cl.⁴ G01R *31/26*; H01L *21/66*

U.S. Cl. 324—158 R **16 Claims**



1. A method for imaging defects in a semiconductor body, comprising the steps of:

oxidizing a first surface of said semiconductor body;

exposing said oxidized first surface to an ionized gas held at a fixed electrical potential;

passing said body beneath a stationary linear electrode separated from said exposed first surface, said linear electrode extending linearly substantially transverse to the direction in which said body is passed and being substantially surrounded by a ground electrode disposed in a plane parallel to the plane in which said body is passed;

scanning a focused beam of light in proximity to said linear electrode and along its length onto said first surface; and

detecting the signal on said linear electrode referenced to said ground electrode.

4,599,559

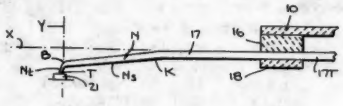
TEST PROBE ASSEMBLY FOR IC CHIPS

Arthur Evans, Brookfield Center, Conn., assignor to Wentworth Laboratories, Inc., Brookfield, Conn.

Continuation-in-part of Ser. No. 491,233, May 3, 1983, abandoned. This application Jul. 22, 1985, Ser. No. 757,502

Int. Cl.⁴ G01R *1/073*

U.S. Cl. 324—158 P **7 Claims**



1. A test probe assembly for testing an integrated circuit chip before leads are applied to the contacts thereof deployed on said chip in a common plane, said assembly having consistent scrubbing characteristics and comprising:

A. a planar insulation card provided with a port, said card having on its underface a printed circuit whose traces are connected to a plurality of test terminals connectable to test equipment for testing the chip;

B. a mounting ring of uniform thickness formed of dielectric material surrounding said port and secured to said card at the underface thereof; said ring having a planar face parallel to the plane of the card; and

C. a radial array of fine wires having a predetermined diameter supported on the planar face of the ring and maintained in planar position thereon by a molded layer of dielectric material adherent to said face in which the wires are embedded, the wires being cantilevered from the ring across the port and converging toward the central region thereof, below which is disposed the chip to be tested which is raisable toward said card, the leading end of each cantilevered wire being tapered and being double bent to define a needle having a shank section which is downwardly inclined relative to the planar face of the ring and a relatively short tip section terminating in a tip which engages a respective contact on the chip which, as it is raised, causes lateral displacement of the tip to effect scrubbing of said contact, the tip section forming an obtuse angle with the shank section and having a downward slope whereby the tips of the needles are exposed to view through a microscope for purposes of alignment, the trailing end of each wire being connected to a respective trace, the diameter of the wire at the junction of the shank section and the tip section of the needle being substantially smaller than said predetermined diameter to make possible a high needle density.

4,599,560

AC EXCITED TRANSDUCER HAVING STABILIZED PHASE SENSITIVE DEMODULATOR CIRCUIT

Norman R. Sanford, Piqua, and Gerald L. Tumbush, Dayton, both of Ohio, assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed Apr. 11, 1983, Ser. No. 483,465

Int. Cl.⁴ G01B *7/14*; G05B *1/06*; G08C *19/06*

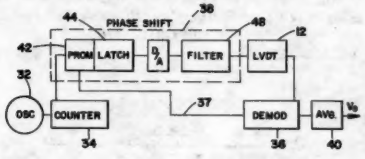
U.S. Cl. 324—207 **13 Claims**

1. A signal conditioning circuit having a transducer, with a mechanical input for sensing movement and an electrical input which is excited by a carrier frequency signal to provide a modulated output signal indicative of the mechanical movement sensed, and a demodulator connected to the output of the transducer for demodulating the transducer's output signal, characterized by:

a relatively high frequency oscillator;

a counter connected to the oscillator and providing a lower frequency signal for driving the demodulator;

a programmable memory having preprogrammed data stored therein and addressed by output signals from said counter, said memory having a first output connected with said demodulator and providing a first digital output of a processed sine wave defining a reference signal having a first selected phase, and having a second output providing a second digital output of a processed sine wave having a second selected phase; and,



a digital to analog converter connected with the second output of said memory for converting the second digital sine wave output from said memory to an analog sine wave output which is connected to provide the excitation signal to said transducer.

4,599,561

DEVICE FOR DETECTING THE RELATIVE AND ABSOLUTE POSITION OF A MOVING BODY

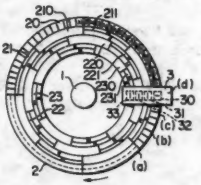
Tadashi Takahashi; Kunio Miyashita, both of Hitachi, and Hiroshi Hayashida, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 4, 1982, Ser. No. 432,685

Claims priority, application Japan, Oct. 6, 1981, 56-158088

Int. Cl.⁴ G01B *7/14*; H01L *43/08*

U.S. Cl. 324—208 **12 Claims**



1. A position detecting device including a moving body provided on a surface thereof with a magnetic material, and magnetoresistive elements disposed opposite to and in close proximity to said magnetic material, comprising:

an encoding track provided on said moving body and containing a magnetic signal recorded with a predetermined direction of magnetization;

a plurality of concentric position detecting tracks provided on said moving body and containing a magnetic signal recorded in spaced areas of equal electrical angle with a direction of magnetization intersecting with said predetermined direction of magnetization of said encoding track; and

magnetoresistive elements formed on an insulating substrate and facing said encoding track and said position detecting track, each of said magnetoresistive element being placed so as to intersect the direction of magnetization in a respective track facing said magnetoresistive element.

4,599,562

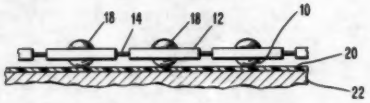
METHOD AND APPARATUS FOR MAGNETICALLY MEASURING A COATING WITH A PLURALITY OF MAGNETS

Frank Koch, Ogdensburg, N.Y., assignor to DeFelsko Corporation, Ogdensburg, N.Y.

Continuation-in-part of Ser. No. 549,569, Nov. 7, 1983, abandoned. This application Oct. 10, 1984, Ser. No. 658,215

Int. Cl.[4] G01B 7/10

U.S. Cl. 324—230 34 Claims



16. A gauge for measuring thickness of a surface coating on a magnetizable substrate, said gauge comprising:

a plurality of magnets, each magnet having a lower surface portion and an upper surface portion;

a plurality of spacer means providing predetermined amounts of spacing over each upper surface region, said amounts of spacing differing from magnet to magnet;

means flexibly connecting said magnets in spaced relation to one another, whereby said magnets may be arranged along the surface coating with said lower surface portions of the magnets in contact with said surface coating; and

a magnetizable lifting member movable into contact with each of said plurality of spacer means, whereby upon the lifting of the lifting member from contact with a selected one of said spacer means, magnetic attraction between said lifting member and the respective magnet may be compared against magnetic attraction between the respective magnet and said magnetizable substrate.

4,599,563

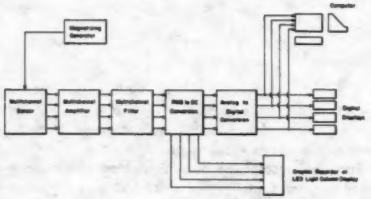
BARKHAUSEN NOISE METHOD FOR ANALYZING THE ANISOTROPIC PROPERTIES OF FERROMAGNETIC STEEL

Seppo I. Tiitto, and Kirsti I. Mielityinen-Tiitto, both of Pittsburgh, Pa., assignors to American Stress Technologies, Inc., Pittsburgh, Pa.

Filed Oct. 4, 1983, Ser. No. 538,968

Int. Cl.[4] G01R 33/12; G01N 27/72; G01B 7/24

U.S. Cl. 324—232 3 Claims



1. A method for determining the suitability of rolled ferromagnetic steel for further forming operations comprising the steps of:

generating Barkhausen noise within the microstructure of said steel simultaneously in at least three different directions;

sensing said Barkhausen noise in each of said directions without physical contact between the means for sensing and said steel;

continuously monitoring the intensity variation of said sensed Barkhausen noise in each of said directions;

constructing a noise pattern based on the Barkhausen noise intensity variations sensed in all of said directions; and

comparing said pattern against predetermined Barkhausen noise intensity patterns representative of various steel qualities.

4,599,564

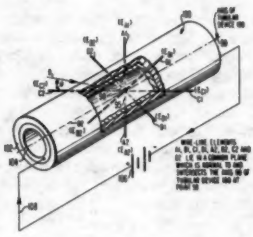
TUBULAR SEMICONDUCTOR MAGNETIC FIELD SENSOR AND CIRCUITS FOR USE THEREWITH

Kevin C. Kelleher, Washington Township, Daviess County, and Larry M. Hughes, Indianapolis, both of Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Nov. 7, 1983, Ser. No. 549,563

Int. Cl.[4] G01R 33/06; H03K 17/90

U.S. Cl. 324—251 4 Claims



1. An arrangement employing the Hall effect for indicating the direction of an ambient magnetic field and comprising:

a monolithic device of a semi-conductive material, said device being in the form of a tube having at any position between the two ends of said tubular device a cross section defining a continuous semiconductive path;

current generating means for creating a longitudinal current between said two ends of said device, which longitudinal current, in the absence of a magnetic field, is circumferentially uniformly distributed;

a plurality of conductive, wire-like elements, each being connected into said tubular device along a line extending radially through the body of said tubular device, each said line being directed towards the axis thereof and lying in a common plane normal to the axis of said tubular device and with adjacent ones of said wire like elements being spaced apart equal angular distances to divide the 360° angular distance around said tubular device into equal angular segments; and

first means responsive to the relative voltages induced in said wire-like elements when said tubular device is placed in a magnetic field to indicate the direction of said magnetic field.

4,599,565

METHOD AND APPARATUS FOR RAPID NMR IMAGING USING MULTI-DIMENSIONAL RECONSTRUCTION TECHNIQUES

John C. Hoenninger, III, Oakland; Lawrence E. Crooks, Richmond; Mitsuaki Arakawa, San Mateo; Jerome R. Singer, Berkeley, all of Calif., assignors to The Regents of the University of Calif., Berkeley, Calif.

Continuation-in-part of Ser. No. 331,008, Dec. 15, 1981, which is a continuation-in-part of Ser. No. 120,875, Feb. 12, 1980, Pat. No. 4,318,043, which is a continuation-in-part of Ser. No. 926,571, Jul. 20, 1978, Pat. No. 4,297,637. This application Jul. 19, 1983, Ser. No. 515,117

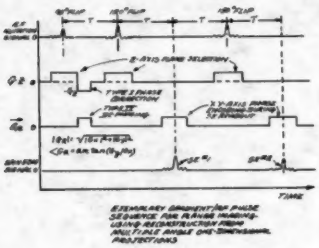
The portion of the term of this patent subsequent to Oct. 27, 1998, has been disclaimed.

Int. Cl.[4] G01N 27/00

U.S. Cl. 324—309 36 Claims

5. A method of generating multi-dimensional NMR signals, said method comprising the steps of:

(a) selectively nutating the nuclei in a first sub-volume of an object with a predetermined r.f. nutation pulse;
(b) thereafter subjecting said object to a predetermined nuclei de-phasing magnetic field gradient to thus correspondingly phase-encode the just nutated nuclei;
(c) selectively nutating the nuclei in at least a portion of said first sub-volume with a 180° r.f. nutation pulse;
(d) measuring the resulting first NMR spin echo signal emanating from said portion while subjecting said object to a predetermined magnetic field gradient;
(e) again selectively nutating the nuclei in at least a portion of said first sub-volume with a 180° r.f. nutation pulse;



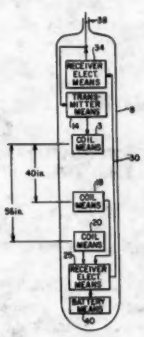
(f) measuring the resulitng second NMR spin echo signal emanating from said portion while subjecting said object to a predetermined magnetic field gradient;
(g) repeating steps (a)–(f) for each of different other sub-volumes of the object during the spin-lattice relaxation time T1 of the nuclei in said first sub-volume; and
(h) repeating steps (a)–(g) using different predetermined nuclei de-phasing magnetic fields in step (b) to thus generate a corresponding set of plural measured first and second NMR spin echo signals as said multi-dimensional NMR signals.

4,599,566

HIGH TRANSMITTING POWER DEEP PENETRATION WELL LOGGING SONDE

Percy T. Cox, and Wayne F. Warren, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 31, 1983, Ser. No. 480,639
Int. Cl.⁴ G01V 3/10
U.S. Cl. 324—341 **3 Claims**



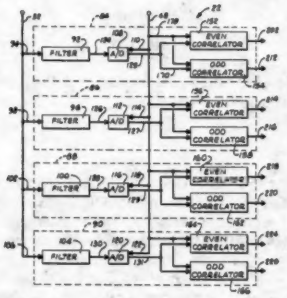
1. A dielectric well logging sonde comprising:
a housing;
transmitter means located within said housing for transmitting electromagnetic energy at a predetermined dielectric logging frequency and at a power level substantially greater than 2 watts; and
a pair of receiver means, each receiver means being means for receiving electromagnetic energy and providing a signal representative of the received electromagnetic energy, one receiver means being located at least 40 inches from the transmitter means and the other receiver means being located at least 50 inches from the transmitting means.

4,599,567

SIGNAL REPRESENTATION GENERATOR

Pierre L. Goupillaud, Del Mar, Calif.; Jean P. Morlet, St. Germain en Laye, and Alexandre Grossmann, Roy d'Espagne, both of France, assignors to Enelf Inc., San Diego, Calif.

Filed Jul. 29, 1983, Ser. No. 518,429
Int. Cl.⁴ G01R 23/165
U.S. Cl. 324—77 G **18 Claims**



11. An apparatus for generating a representation of an arbitrary signal, comprising:
a plurality of octave circuits, each octave circuit associated with a selected octave of a selected frequency range, for receiving the signal and generating a set of correlation values between different frequency components of the signal and a reference signal derived from a standard wavelet having both time and frequency characteristics in response to reception by the octave circuit of a selected number of clock pulses defining a correlation time interval for the octave circuit;
clock means for providing the clock pulses to the octave circuits, the clock means providing clock pulses to different octave circuits at rates that increase by a factor of two for octave circuits associated with successively higher octaves of the frequency range, whereby said correlation time intervals decrease by a factor of two for octave circuits associated with successively higher octaves of the frequency range; and
means for recording the correlation values at times controlled by said clock.

4,599,568

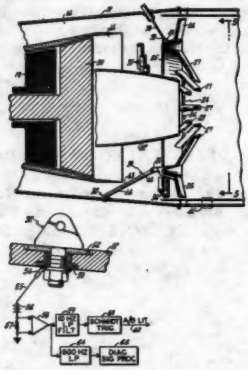
ELECTROSTATIC AFTERBURNER LIGHT-OFF DETECTOR

Robert P. Couch, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1982, Ser. No. 454,117
Int. Cl.⁴ F02C 7/262
U.S. Cl. 328—6 **3 Claims**

1. A light-off detector for the afterburner of a gas turbine engine including a metallic flameholder grate, comprising:
an ion/electrostatic probe formed as said flameholder grate with means totally electrically insulated the gate from the other engine parts;
a source of bias voltage; and

circuit means for connecting said source to said flameholder and responsive to current flow through said flameholder to



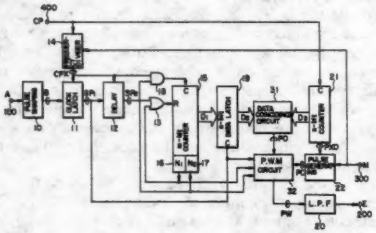
provide a light-off signal indicative of the presence of flame adjacent said flameholder.

4,599,569

METHOD AND APPARATUS FOR DETECTING A PHASE OR FREQUENCY ERROR OF A SIGNAL

Takashi Furuhata, Yokohama; Taihei Nakama; Yuuhei Abe, both of Katsuta, and Kenji Satoh, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 13, 1984, Ser. No. 579,593
Claims priority, application Japan, Feb. 14, 1983, 58-21443
Int. Cl.[4] H03K *5/26*
U.S. Cl. 328—111 **4 Claims**



1. A detector circuit for detecting a phase or frequency error or an input signal, comprising:

means for selecting one mode of at least two detection mode according to a phase or frequency of said input signal, each mode having a reference value of a phase or frequency of said input signal, said reference values of the detection modes being different from each other;

counter means for counting clock pulses by predetermined numbers;

data latching means for latching counted data of said counter means in response to a sampling pulse produced from said input signal;

pulse generating means for generating a pulse signal having a phase corresponding to said counted data latched by said latching means;

means for generating a carrier signal in response to the mode selected by said selecting means; and

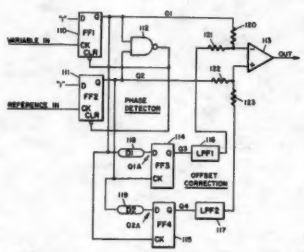
pulse width modulation circuit means for pulse width modulating said carrier signal with a modulation factor in response to said pulse signal, the modulation factor of each of the detection modes being different from each other.

4,599,570

PHASE DETECTOR WITH INDEPENDENT OFFSET CORRECTION

Robert L. Cloke, Santa Clara, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed Jul. 21, 1982, Ser. No. 400,494
Int. Cl.[4] H03K *5/13, 5/22*
U.S. Cl. 328—155 **15 Claims**



1. An automatic offset nulling circuit coimprising,

phase detector circuit means (**110, 111**) for receiving a variable input signal and a reference input signal and producing a pair of output signals (Q1, Q2,) representative of the time and phase difference between the respective input signals,

offset correction circuit means (**114, 115, 118, 119**) connected for receiving said pair of output signals from said phase detector means and selectively producing a pair of offset correction signals (Q3, Q4) representative of the time and phase difference relationship between said pair of output signals from said phase detector circuit means, and

combining means (**120, 121, 122, 123, 113**) connected to receive said pair of output signals (Q1, Q2) from said phase detector circuit means and said offset correction signals (Q3, Q4) from said offset correction circuit means to produce a signal (OUT) representative of the combination of said pair of output signals from said phase detector circuit means and said offset correction signals from said offset correction circuit means.

4,599,571

LEVEL COMPENSATION CIRCUIT

Keishi Matsuno, Hino, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed May 7, 1985, Ser. No. 731,285
Claims priority, application Japan, Jul. 18, 1984, 59-149148
Int. Cl.[4] H03F *3/217*
U.S. Cl. 330—11 **6 Claims**

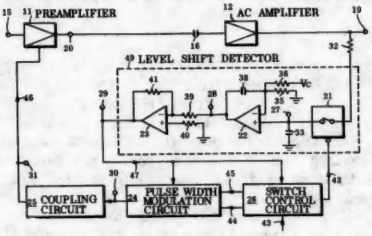
1. A level compensation circuit comprising:

a preamplifier for amplifying an input signal and producing a synthesized signal of the input signal and a level compensation signal;

an AC amplifier for amplifying the synthesized signal;

level shift detection means for detecting a zero level of an output signal of said AC amplifier, and for comparing said zero level to a reference level to produce an error signal;

pulse width modulation means for generating a pulse of a pulse width corresponding with said error signal; and



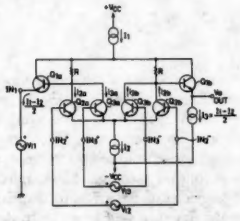
coupling means for coupling said pulse generated by said pulse width modulation means to said preamplifier.

4,599,572

VOLTAGE ADDER CIRCUIT

Kazuaki Nakayama, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 5, 1983, Ser. No. 558,237
Claims priority, application Japan, Dec. 3, 1982, 57-211381
Int. Cl.⁴ H03F *3/45*
U.S. Cl. 330—69 **9 Claims**



1. A voltage adder circuit for adding at least one signal supplied in balanced form to at least one signal supplied in unbalanced form, comprising; at least one differential transistor pair including a load coupled to collectors of each transistor of said pair, said balanced signal being supplied between bases of said transistors of said pair; and an input transistor having a base-collector coupled across at least a portion of one of said loads, said unbalanced signal being applied to an emitter of said input transistor, an output of said circuit being derived from a signal produced at the other one of said loads.

4,599,573

SWITCHED CAPACITOR FILTER UTILIZING A DIFFERENTIAL INPUT AND OUTPUT CIRCUIT AND METHOD

Daniel Senderowicz, Berkeley, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 311,144, Oct. 13, 1981, Pat. No. 4,574,250. This application May 28, 1985, Ser. No. 738,397
Int. Cl.⁴ H03F *1/14*
U.S. Cl. 330—107 **3 Claims**

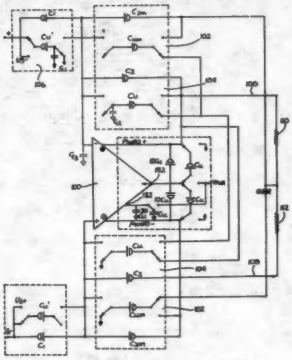
1. A power amplifier circuit with a gain setting capability independent of frequency and having, a sin x/x distortion correction characteristic, where x is a function of time, comprising:

a switched capacitor differential integrator having differential inputs and differential outputs;

a first feedback network coupled between a positive input of said differential inputs and said outputs;

said first network including a first capacitor having a value C_u, a second capacitor having a value C_2, a third capacitor having a value C_{um} and a fourth capacitor having a value C_{2m}, said first and third capacitors being switched, said second and fourth capacitors being non-switched, said first and second capacitors for setting frequency response, said third and fourth capacitors for setting gain;

a second network including a fifth capacitor having a value C_u, a sixth capacitor having a value C_2, a seventh capacitor having a value C_{um} and an eighth capacitor having a value C_{2m}, said fifth and seventh capacitors being



switched, and said sixth and eighth capacitors being non-switched, said fifth and sixth capacitors for setting frequency response, said seventh and eighth capacitors for setting gain;

wherein gain can be arbitrarily set by two resistors coupled between a common mode terminal and said differential outputs, and wherein gain setting will not affect the frequency response of said amplifier circuit provided that:

$$C_u/C_{um}=C_2/C_{2m}$$

4,599,574

SELECTABLE GAIN INSTRUMENTATION AMPLIFIER

William R. Chambers, Walnut, Calif., assignor to Neff Instrument Corporation, Monrovia, Calif.

Filed Jan. 14, 1985, Ser. No. 691,709
Int. Cl.⁴ H03G *3/30*; H03F *3/45*
U.S. Cl. 330—254 **16 Claims**

13. A selectable gain differential amplifier system comprising:

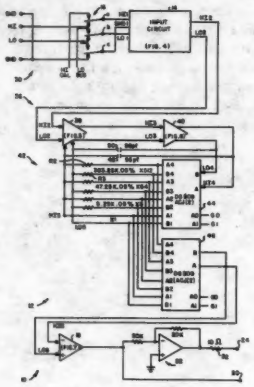
a high gain differential amplifier having noninverting, high input impedance inputs coupled to receive a differential input signal and having an inverting input coupled to receive a differential feedback signal and generating an amplified differential output signal that is proportional to a difference between the input signal and the feedback signal;

a feedback network coupled to provide the feedback signal to the high gain amplifier, the feedback network including a plurality of different matched pairs of feedback paths, each pair of feedback paths providing a different gain for the selectable gain amplifier;

a first multiplexer coupled to the high gain amplifier output signal and to each different feedback path of the feedback network, the first multiplexer being responsive to a received gain selection signal to couple the amplifier output signal to a respective pair of feedback paths indicated by the received gain selection signal; and

a second multiplexer coupled to each different feedback path of the feedback network, the second multiplexer receiving

the gain selection signal and being responsive thereto to couple to the selectable gain amplifier system output the



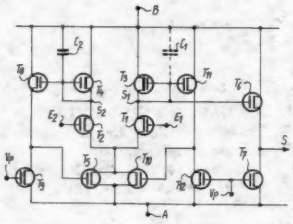
pair of feedback paths indicated by the gain selection signal.

4,599,575

BROAD-BAND DIFFERENTIAL AMPLIFIER WITH DOUBLE REVERSE FEED-BACK OF COMMON MODE

Patrick Bernard, Grenoble, France, assignor to Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux Efcis, Grenoble, France

Filed Apr. 3, 1985, Ser. No. 719,455
Claims priority, application France, Apr. 6, 1984, 84 05483
Int. Cl.[4] H03F *3/45, 3/16*
U.S. Cl. 330—258 **3 Claims**



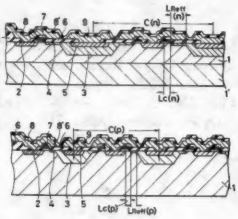
1. Differential amplifier comprising a differential stage and a follower stage, the differential stage comprising a common branch connected between a first supply terminal and the junction point of two differential branches connected furthermore to a second supply terminal, the common branch comprising two transistors in parallel the gates of which are separately controlled, and each differential branch comprising an input transistor T1, T2 in series with a load transistor, the differential stage having two inputs E1, E2, respectively connected to the gates of the input transistors T1, T2 of the differential branches, and two outputs that are the junction points of the input transistors with the load transistors T3, T4 the first output S1 being connected to the input of the follower stage T6, T7 and the output of the follower stage constituting the output of the amplifier, wherein there are provided two common mode feed-back branches each constituted by a follower stage connected between a respective output S1, S2 of the differential stage and the gate of a respective transistor T5, T10 of the common branch, a capacitor C2 being connected between the second output of the differential stage and the second supply terminal B, so that that equivalent capacitance between this second output and the second supply terminal is substantially greater than the equivalent capacitance between the first output S1 and the second supply terminal B.

4,599,576

INSULATED GATE TYPE FIELD EFFECT SEMICONDUCTOR DEVICE AND A CIRCUIT EMPLOYING THE DEVICE

Isao Yoshida, Tokyo; Takeaki Okabe, Kokubunji; Shikayuki Ochi, Akishima; Hidefumi Ito; Masatomo Furumi, both of Takasaki; Masaru Takeuchi, Tokyo, and Minoru Nagata, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 1, 1978, Ser. No. 882,625
Claims priority, application Japan, Apr. 15, 1977, 52-42651
Int. Cl.[4] H01L *29/78;* H03F *3/18, 3/16*
U.S. Cl. 330—264 **8 Claims**



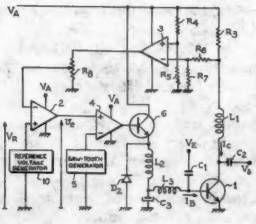
7. An audio amplifier comprising a P channel type insulated gate field effect transistor and an N channel type insulated gate field effect transistor, each transistor having a source and a drain electrode and an insulated gate electrode, connecting means for connecting said source electrodes of both transistors in common to an output terminal, bias adjusting means connected to said gate electrodes of both transistors, means for supplying an input signal to said gate electrodes, and connecting means for connecting an audio speaker to said output terminal, wherein each said transistor has an offset gate region in a semiconductor body and said N channel type transistor has a length of said offset gate region longer and a channel width smaller than said P channel type transistor.

4,599,577

TRANSISTORIZED AMPLIFICATION STAGE WITH IMPROVED POLARIZATION DEVICE

Michel Nollet, Noisy le Roi, France, assignor to Thomson CSF, Paris, France

Filed Feb. 26, 1985, Ser. No. 705,705
Claims priority, application France, Feb. 28, 1984, 84 03032
Int. Cl.[4] H03F *1/30*
U.S. Cl. 330—290 **4 Claims**



1. A transistorized amplification stage polarization device having a power supply and being provided for a transistorized

amplification stage including at least one transistor having a base, a collector and an emitter, said device maintaining a constant polarization current in said at least one transistor of said transistorized amplification stage for controlling said at least one transistor, said device comprising:

comparing means adapted to compare an image signal of the polarization current of said at least one transistor to a reference signal (V_R), and

a chop current regulator interposed between the comparing means and the base of said at least one transistor, said current regulator being controlled by the comparing means so as to deliver the polarization power for polarizing the base of said at least one transistor said polarization power being a function of the resulting error signal obtained at the output of said comparing means.

4,599,578

PROTECTION CIRCUIT

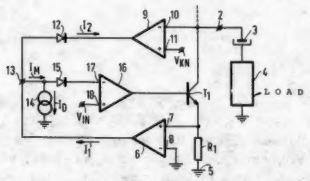
Evert Seevinck, Delden, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 19, 1984, Ser. No. 622,045

Claims priority, application Netherlands, Jun. 21, 1983, 8302197

Int. Cl.⁴ H03F *3/04*; H02H *7/20*

U.S. Cl. 330—298 **3 Claims**



1. Protection circuit for protecting a transistor having an emitter and a collector from overloading, comprising:

first means connected to said transistor for generating a first signal constituting a measure of the emitter current of said transistor;

second means connected to said transistor for generating a second signal having a constant value when said collector emitter voltage exceeds a predetermined voltage, said second signal constituting a measure of the difference between said predetermined voltage and said collector-emitter voltage of said transistor when said collector emitter voltage is less than said predetermined voltage; and

third means connected to said first and second means for creating a difference signal corresponding to the difference between said first and second signals and for limiting said emitter current of said transistor when said difference signal exceeds a predetermined threshold value.

4,599,579

FREQUENCY SYNTHESIZER HAVING JITTER COMPENSATION

Kenneth D. McCann, Reigate, England, assignor to U.S. Philips Corporation, New York, N.Y.

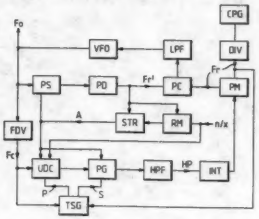
Filed Oct. 26, 1983, Ser. No. 545,552

Claims priority, application United Kingdom, Nov. 5, 1982, 8231709

Int. Cl.⁴ H03B *7/00*

U.S. Cl. 331—1 R **14 Claims**

1. A frequency synthesizer comprising a reference frequency generator coupled to a frequency control circuit which includes a variable frequency reduction means including a cycle cancellation icrcuit arranged to cancel a cycle of the frequency to be reduced by the variable frequency reduction means for each input pulse to the cycle cancellation circuit from an offset frequency generator, the offset frequency generator being arranged to produce n pulses for each group of x pulses of a given frequency Fr to provide a variable offset frequency (n/x)Fr where n is an integer smaller than x, and further comprising a jitter compensation signal circuit connected to the frequency control circuit, an output of the jitter compensation signal circuit being arranged such that a compensation signal at the output causes compensation, at least partly, for any jitter in the period of the output frequency of the synthesizer that would otherwise be caused as a result of each cancelled cycle,



the jitter compensation signal circuit deriving the compensation signal as a function of the offset frequency via an analogue integrator, characterized in that the jitter compensation signal circuit further includes means for generating, with respect to a given d.c. level, a bidirectional signal such that, for each group of x periods of the given frequency Fr, there are n periods over each of which an integral of the bidirectional signal is proportional to $-(x-n)$, and $(x-n)$ periods of the given frequency Fr over each of which an integral of the bidirectional signal is correspondingly proportional to n.

4,599,580

CIRCUIT FOR COMPARING TWO OR MORE FREQUENCIES

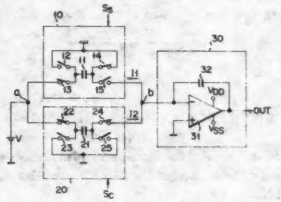
Akira Yamaguchi, Yokohama; Hiroshi Shigehara, Tokyo, and Hidemi Iseki, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Nov. 16, 1984, Ser. No. 672,478

Claims priority, application Japan, Nov. 17, 1983, 58-216710; Nov. 17, 1983, 58-216712; Nov. 17, 1983, 58-216721; Nov. 17, 1983, 58-216722

Int. Cl.⁴ H03L *7/08*

U.S. Cl. 331—8 **21 Claims**



1. A frequency comparing circuit, comprising:

first means having negative equivalent resistance, the value of which being determined according to the frequency of a first signal;

second means having positive equivalent resistance, the value of which being determined according to the frequency of a second signal;

third means for supplying DC bias to said first and second means; and

fourth means for integrating composite value of output currents of said first and second means.

4,599,581

TEMPERATURE STABILIZING MICROWAVE OSCILLATOR CIRCUIT

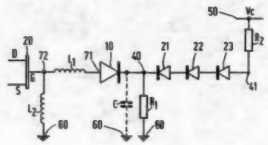
Christos Tsironis, Yerres, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 25, 1984, Ser. No. 614,186

Claims priority, application France, Jun. 1, 1983, 83 09071

Int. Cl.[4] H03B *5/04*; H03L *1/02*

U.S. Cl. 331—66 **6 Claims**



1. A circuit for temperature-stabilizing the frequency of a Schottky type FET microwave oscillator by forming a capacitance which linearly varies with temperature so as to compensate for the temperature variation of the oscillator FET, comprising:

an active semiconductive device of the Schottky type having an output electrode and an input electrode;

a voltage divider for applying a temperature-variable control voltage to the output electrode of said semiconductive device; said voltage divider comprising, connected in series between ground and a source of direct supply voltage, a first resistor, a succession of active diode-connected elements of the Schottky type connected in the blocking direction, and a second resistor;

said first resistor being connected between ground and the output electrode of said semiconductive device;

means for coupling the input electrode of said semiconductive device to the oscillator FET;

and each of said diode-connected elements having a threshold voltage level for conduction which linearly decreases with increasing temperature;

whereby the capacitance-to-ground of the input electrode of said semiconductive device is linearly varied with temperature by said control voltage so as to compensate for the temperature variation of the oscillator FET.

4,599,582

DEVICE FOR SWITCHING A DIELECTRIC-RESONATOR-STABILIZED OSCILLATOR ON AND OFF

Gary K. Lewis, Upper Marlboro, and Melvin Zisserson, College Park, both of Md., assignors to Litton Systems, Inc., College Park, Md.

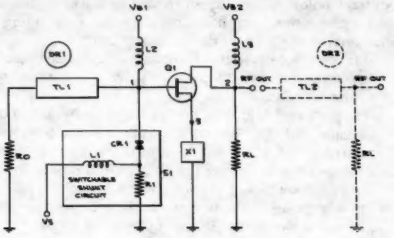
Filed Jul. 1, 1985, Ser. No. 750,505

Int. Cl.[4] H03B *5/18*

U.S. Cl. 331—117 D **5 Claims**

1. In a device for switching a dielectric-resonator-stabilized oscillator of the type which includes an RF oscillator circuit having at least one active element, a tunable dielectric resonator, said dielectric resonator being tuned to a frequency within the resonant frequency region of said oscillator circuit, and a transmission line having a characteristic impedance to interconnect said resonator to said oscillator circuit, the improvement comprising:

a shunt to ground through the characteristic impedance of said transmission line, connectable between said oscillator circuit and said dielectric resonator; and



means for connecting and disconnecting said shunt to said transmission line.

4,599,583

MIXED DUAL FREQUENCY GENERATING SYSTEM

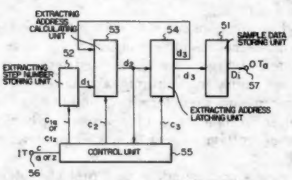
Ryoji Shimozono, Kawasaki; Yasunori Ogawa; Yasuo Tanaka, both of Yokohama, and Shigeo Sano, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 15, 1984, Ser. No. 671,775

Claims priority, application Japan, Nov. 19, 1983, 58-217101; Nov. 24, 1983, 58-221009

Int. Cl.[4] H03B *28/00*; H04L *27/12*

U.S. Cl. 332—9 R **11 Claims**



7. A mixed dual frequency generating system comprising:

sampled data storing means, having an output, for storing in consecutive addresses a plurality of digital sampled data obtained by sampling, at a predetermined sampling frequency, a fundamental sine wave having a fundamental frequency;

extracting step number storing means for storing at least one extracting step number;

data extracting means for extracting, at the predetermined sampling frequency, output data from the digital sampled data stored in said sampled data storing means by accessing extracting addresses of said sampled data storing means, the extracting addresses being calculated by adding the extracting step number to a first extracting address to form a second extracting address and then assigning the second extracting address to the first extracting address; and

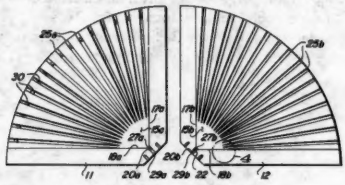
output data fixing means for outputting data "0" at alternate extracting timings.

4,599,584

POWER DIVIDER/COMBINER APPARATUS COMPRISING A FAN SHAPED WAVEGUIDE

Bill H. Sasser, Tempe; Roger J. Eckstein, Phoenix, and Kenneth Engle, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 26, 1984, Ser. No. 665,321
Int. Cl.[4] H01P 5/12
U.S. Cl. 333—125 11 Claims



1. A power divider/combiner comprising:

a base member formed of electrically conductive material and defining a generally fan shaped waveguide cavity therein having a pair of side walls which extend from an apex radially outwardly in a plane through said base member;

an input/output waveguide channel formed in said base member in communication with said waveguide cavity generally at said apex and lying generally in said plane; and

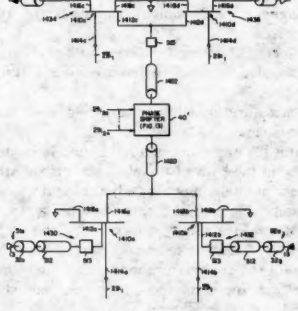
a plurality of output/input waveguide channels formed in said base member in communication with said waveguide cavity, said output/input channels extending radially outwardly from said cavity between said side walls with substantially equal lengths and equal angular spacings therebetween and lying generally in said plane.

4,599,585

N-BIT DIGITALLY CONTROLLED PHASE SHIFTER

James L. Vorhaus, Newton; Robert W. Bierig, Hopkinton, and Robert A. Pucel, Needham, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 353,117, Mar. 1, 1982, abandoned. This application Apr. 23, 1984, Ser. No. 602,269
Int. Cl.[4] H03H 7/18; H01P 1/18
U.S. Cl. 333—164 24 Claims



1. A phase shifter comprising:

a plurality of transistors, each transistor including a control electrode fed by a control signal, an input electrode, a reference electrode connected to a reference potential with said control signal having a voltage level with respect to said reference potential, and an output electrode;

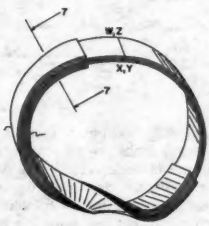
a plurality of transmission lines, each one of said lines having a predetermined electrical pathlength and being electrically coupled between a first one of the input and output electrodes of a corresponding one of the plurality of transistors, and a corresponding one of input and output ports of the phase shifter, to provide an output signal having a predetermined voltage level with respect to the reference potential and having a predetermined phase shift relative to an input signal fed to the input port, said input signal having a predetermined voltage level with respect to said reference potential with said phase shift being related to the predetermined electrical pathlength of a selected one of said transmission lines, with said selected transmission line being selected in accordance with the voltage level of the control signal applied to the control electrode of each transistor.

4,599,586

MOBIUS CAPACITOR

Thomas J. Brown, 82 Sheldon Ave., Staten Island, N.Y. 10312

Filed Dec. 8, 1982, Ser. No. 434,411
Int. Cl.[4] H03H 7/01, 1/02
U.S. Cl. 333—172 6 Claims



1. An electrical component comprising in combination:

(a) a layer of non-conductive material having opposite surfaces defining a continuous uniform surface in the form of a mobius strip

(b) a single layer of resistive material disposed in a continuous manner circumferentially along the surface of the formed mobius strip

(c) a second layer of non-conductive material disposed in a continuous manner circumferentially covering the said continuous surface of resistive material

(d) two outer resistive materials separately disposed in series along the continuous surface covering the said second layer of non-conductive material in such a manner that these outer resistive materials are diametrically opposite one another and the normals to the surfaces of the said outer resistive materials are parallel to each other and also parallel to the non-orientable normal to the continuous surface of the mobius strip

(e) electrical leads connected to the separate outer layers of resistive material.

4,599,587

IMPEDANCE ELEMENT

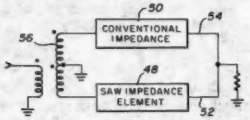
Clinton S. Hartmann, Richardson, and Peter Wright, Dallas, both of Tex., assignors to R. F. Monolithics, Inc., Dallas, Tex.

Filed Dec. 3, 1984, Ser. No. 677,518
Int. Cl.[4] H03H 7/01, 7/09, 9/25, 9/64
U.S. Cl. 333—176 22 Claims

1. An impedance element comprising:

a. a piezoelectric substrate, and

b. a single port, surface acoustic wave transducer mounted on said substrate and adjusted to generate conductance



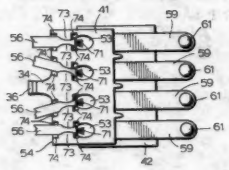
and susceptance response characteristics of a shape as shown in FIG. 9.

4,599,588

METHOD AND APPARATUS FOR ATTACHING LEADS

Richard E. Bell, Princeton, Ind., assignor to AMF Incorporated, White Plains, N.Y.

Filed Jan. 13, 1984, Ser. No. 570,602
Int. Cl.[4] H01H *67/02*
U.S. Cl. 335—127 **28 Claims**



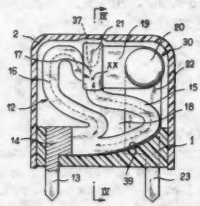
1. A relay including stationary contact means, movable contact means, means including an armature for moving said movable contact means relative to said stationary contact means to operate said relay, and coupling means for coupling electrically conductive lead means to said movable contact means, characterized in that said coupling means comprises a carrier (41) formed of insulating material and mounted to said armature (32) for movement therewith, said carrier supporting said lead means (56) and said movable contact means (31) in electrical contact with one another at a first location on said lead means, said carrier (41) further including means (73) integral therewith for attaching said lead means (56) to said carrier (41) at a second location on said lead means (56) spaced from said first location.

4,599,589

POLARIZED ELECTROMAGNETIC RELAY WITH A SINGLE-BREAK SWITCH

Gérard Koehler, Ville D'Avray, France, assignor to La Telemecanique Electrique, Nanterre, France

Filed Mar. 5, 1985, Ser. No. 708,422
Claims priority, application France, Mar. 14, 1984, 84 03910
Int. Cl.[4] H01H *63/02*
U.S. Cl. 335—133 **9 Claims**



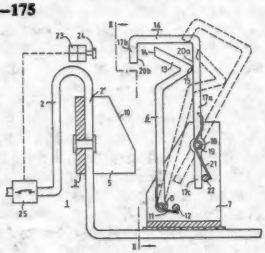
1. A polarized electromagnetic relay provided with at least one single-break switch (30) housed within an internal space of very small volume, said switch comprising a stationary contact (31) carried by a support (22) rigidly fixed to a base (1) of the relay, and a moving contact (20) carried by one end of a flexible strip (12) which is anchored relative to the base (1) in the vicinity of the other end (14) of said strip and which is attached to an actuating member (21) in a predetermined region (17) between its anchoring location (14) and the moving contact (20), said actuating member being rigidly fixed to a moving armature (5) of the relay, wherein the contact-strip (12) is subdivided into at least two branches (15, 16) between its anchoring region (14) and its aforesaid attachment region (17), at least one branch being adapted to follow a non-rectilinear path in order to increase the flexibility of the strip between the anchoring region (14) and the attachment region (17) of said strip.

4,599,590

SWITCH WITH A SELECTIVE RELEASE

Bernhard Preuss, and Karl-Heinz Manthe, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 21, 1984, Ser. No. 684,478
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1983, 3347121
Int. Cl.[4] H01H *71/24*
U.S. Cl. 335—175 **6 Claims**

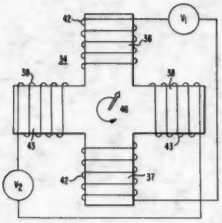


1. A switch with a selective release, comprising
electromagnetic means including a conductor for conducting a current;
a switch means connected in series with said conductor;
a latch coupled to said switch to control the operation thereof;
a stroke armature movably mounted adjacent said electromagnet means;
latch means for operating said latch, said latch means being disposed in the path of travel of said stroke armature;
lever means pivotally mounted adjacent said stroke armature and comprising first and second stops, said lever means being movable to a first position in which said first stop is in the path of said stroke armature and is impacted thereby when said stroke armature moves in a first direction and said second stop is interposed between said stroke armature and said latch means;
the inertias of said stroke armature and said lever means being such that upon impact of said stroke armature against said first stop the second stop of said lever means is rotated out of the path of said stroke armature to permit said stroke armature to contact said latch means.

4,599,591
MAGNETOSTRICTIVE TRANSDUCER

Robert M. Delvecchio, Sunnyvale, Calif., and Karl Foster, Forest Hills Boro, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 8, 1985, Ser. No. 731,697
Int. Cl.[4] H01F 7/00
U.S. Cl. 335—215 **18 Claims**

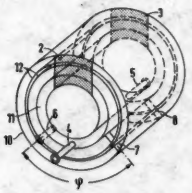


1. A magnetostrictive transducer comprising:
(A) an assembly including magnetostrictive material having one or more magnetic domains;
(B) electrical means for establishing a varying magnetic field of a type to generate, within said magnetostrictive material, a magnetic induction which rotates to induce magnetostrictive domain movement, and
(C) mechanical coupling means connected to said assembly for transfer of magnetostrictive movement of said material.

4,599,592
DEVICE FOR HOLDING THE HOUSING OF A SUPERCONDUCTING MAGNET WINDING

Helmut Marsing, Neunkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 4, 1985, Ser. No. 697,627
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1984, 3407058
Int. Cl.[4] H01F 7/22
U.S. Cl. 335—216 **20 Claims**

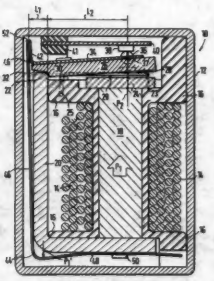


1. A device for holding a winding housing enclosing a superconducting magnet winding which is to be cooled to a low temperature, the winding housing being surrounded by at least one radiation protection shield which can be kept at a comparatively higher temperature, and the radiation protection shield enclosed by an outer housing kept at approximately room temperature, comprising:
(a) at least one poorly heat-conducting suspension device suspending the winding housing and radiation shield within the outer housing;
(b) at least one rigid tubular support element disposed between the outer housing and the winding housing and connected to the radiation protection shield, and consisting at least partially of poorly heat-conducting material said tubular support comprising:
(i) a pressure support of adjustable length, permitting a form-lock fit between the outer housing and the winding housing to be set at room temperature, and
(ii) a fastening device attaching said support to the radiation protection shield; and
(c) a spring element biasing said support in a direction such that a form-locking fit with the outer housing always exists.

4,599,593
TILTING ARMATURE RELAY WITH ADJUSTABLE CONTACT PRESSURE

Werner Minks, Siedlung, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 26, 1984, Ser. No. 665,418
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339082
Int. Cl.[4] H01F 7/13
U.S. Cl. 335—274 **13 Claims**



1. A tilting-armature relay comprising, in combination:
a housing for enclosing a tilting-armature relay;
an excitation coil wrapped about a magnetic core mounted within said housing for providing an electromagnetic field;
a magnet yoke mounted within said housing and connected to said magnetic core for supporting said excitation coil and said magnetic core and for completing a magnetic flux path;
an armature tiltedly mounted above said magnetic core and above an edge of said magnet yoke, said armature being operated in response to said electromagnetic field and pivoting about said magnet yoke edge;
a supporting spring mounted about an exterior side of said magnet yoke for providing a spring force against said armature;
a leaf spring mounted above said armature, said leaf spring being an electrical conductor and carrying a first break contact for operating with said armature, a second break contact insulatively connected to said housing and capable of electrical communication with said first break contact; and
an overlapping connecting piece formed by an intersection of said supporting spring and said leaf spring for firmly connecting said supporting spring to said armature for providing a restoring force to said armature closing said first break contact onto said second break contact and for exactly adjusting a contact pressure therebetween.

4,599,594

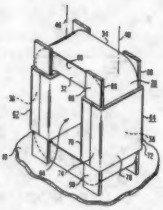
ELECTRICAL INDUCTIVE APPARATUS

Jaime E. Siman, Watkinsville, Ga., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 7, 1985, Ser. No. 699,372

Int. Cl.[4] H01F 27/02, 27/30

U.S. Cl. 336—92 10 Claims



1. Electrical inductive apparatus, comprising:

a tank having a bottom portion,

a magnetic core containing amorphous metal,

said magnetic core having

winding leg and yoke portions which define a window,

means consolidating said magnetic core to make it self-supporting,

said magnetic core being disposed in said tank with the longitudinal axes of said winding leg portions vertically oriented with respect to the bottom portion of the tank,

a flangeless, electrically insulative winding tube disposed about a winding leg portion,

said flangeless winding tube being constructed of members which are assembled about the winding leg and fixed to one another to form a protective box about the winding leg which withstands inwardly directed radial forces without introducing stresses into said magnetic core,

the members of said flangeless winding tube having only first and second different extrudable profiles cuttable to length according to predetermined dimensions of said magnetic core,

and an electrical winding disposed about and fixed to said flangeless winding tube,

said flangeless winding tube and tank cooperatively supporting the weight of said electrical winding, to prevent the weight of said electrical winding from introducing mechanical strains into said magnetic core.

4,599,595

LAMINATED IRON CORE FOR TRANSFORMERS, CHOKE COILS AND THE LIKE

Hugo W. Geschka, Düsseldorf, Fed. Rep. of Germany, assignor to E. Blum GmbH & Co., Vaihingen, Fed. Rep. of Germany

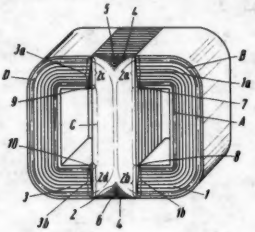
Continuation of Ser. No. 449,632, Dec. 14, 1982, abandoned, which is a continuation of Ser. No. 170,776, Jul. 21, 1980, abandoned, which is a continuation of Ser. No. 908,521, May 22, 1978, abandoned. This application Dec. 28, 1983, Ser. No. 566,144

Claims priority, application Fed. Rep. of Germany, May 21, 1977, 2723099

Int. Cl.[4] H01F 27/24

U.S. Cl. 336—178 7 Claims

1. Iron core for transformers, choke coils and like devices having a plurality of core parts each formed of held-together laminate plates, said core parts including pairs of neighboring core parts which are inclined relative to each other and overlie one another with mutually opposing surfaces thereof in a manner such that magnetic force lines within the laminate plates of neighboring core parts or emerging therefrom undergo a corresponding change in direction, comprising means defining a space which constitutes an at least substantially uniformly varying clearance between the respective mutually opposing surfaces and terminating at a mutual contact location thereof, said clearance being substantially less than one degree and said mutually opposing surfaces of said core parts being disposed so as to define a relatively short inner path and a longer outer path for magnetic force lines, each of said spaces having a region of relatively greater clearance across which said relatively short inner path extends, said longer outer path



extending through said mutual contact locations of the respective mutually opposing surfaces, the surface of one of each pair of core parts being planar and extending across the entire width and length of one end of said one core part and the surface of the other part of each pair of core parts being planar and having at least the same width and length as the planar surface of the respective one core part.

4,599,596

CHIP TYPE FUSE

Hiroo Arikawa, Tokyo, and Yasutada Yuza, Yokohama, both of Japan, assignors to S.O.C. Corporation, Tokyo, Japan

Filed Nov. 29, 1983, Ser. No. 556,011

Claims priority, application Japan, Dec. 1, 1982, 57-180640[U]

Int. Cl.[4] H01H 85/02, 85/16

U.S. Cl. 337—201 1 Claim

1. A chip type fuse for direct surface mounting to a printed circuit board, said fuse comprising:

(a) a base and a cover therefor, both made of heat-resistant and electrically insulating material, said base having a cavity formed substantially in the center thereof,

(b) a pair of electrically conductive terminals at both ends of said base, the top plan view of each of said terminals having a generally H-shaped configuration, each of said terminals having a large portion, a small portion and a middle portion connecting said large and small portions so as to form said generally H-shaped configuration, wherein said terminals are snapped into said base so that the bottom of each of said large portions and small portions can be soldered directly to a printed board circuit, and wherein said small portions of said terminals are spaced apart and in facing relations to each other and positioned in said cavity,

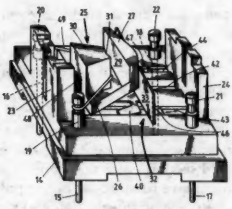
(c) a pair of grooves extending between each of said small portions of said terminals and through said cavity,
(d) a fusible element stretched between said terminals and extending through said grooves and said cavity, the ends of said fusible elements being soldered to said conductive terminals, and
(e) said cover being hermetically sealed to said base by an adhesive, thereby immovably fixing said two terminals in said base.

4,599,597

CIRCUIT PROTECTION DEVICES

Guy Rotbart, Saint-Mande, France, assignor to Societe d'Exploitation Soremec-Chess, Rungis, France

Filed Oct. 15, 1984, Ser. No. 660,887
Claims priority, application France, Oct. 20, 1983, 83 16683; Sep. 27, 1984, 84 14836
Int. Cl.[4] H01H 85/30
U.S. Cl. 337—206 11 Claims



1. A circuit protection device particularly for printed circuit boards, comprising:
a base made of an insulating material;
a first pair of pins projecting from one face of the base for connection to a circuit to be protected and projecting from the other face of the base to terminate in a first pair of pegs;
an elongate fusible element connected between said first pair of pegs;
a second pair of pins for connection to a circuit to be controlled and terminating in a second pair of pegs;
a slider which is adapted to be retained adjacent the first pair of pegs by the fusible element;
resilient means acting on the slider in the direction towards the second pair of pegs;
guide means provided on the base for guiding the travel of the slider;
a contact plate supported by the slider and engageable with the second pair of pegs after fusion of the fusible element; and
co-operating means provided on the base and the slider for ensuring effective rebound—free contact between the contact plate and the second pair of pegs.

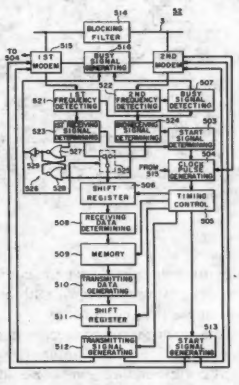
4,599,598

DATA TRANSMISSION SYSTEM UTILIZING POWER LINE

Yoshiyuki Komoda, Osaka; Hitoshi Fukagawa, Kadoma; Yoshiharu Suzuki, Kadoma, and Osamu Tanaka, Kadoma, all of Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan

Continuation of Ser. No. 406,479, Aug. 9, 1982, abandoned. This application May 20, 1985, Ser. No. 735,745
Claims priority, application Japan, Sep. 14, 1981, 56-144910; Nov. 14, 1981, 56-182858
Int. Cl.[4] H04B 3/56
U.S. Cl. 340—310 A 6 Claims

1. A data transmission system for transmitting control data including a plurality of bits in the form of a high frequency signal superimposed on an alternating current imposed on a power line, said system comprising first communicating means and second communicating means coupled to said power line, and a plurality of repeating means serially interposed in said power line between said first and said second communicating means, for transmission of said control data over said power line between said first and said second communicating means and through said repeater means, said control data including an identifying code for identifying an adjacent repeating means,
said first communicating means including
first transmitting means for transmitting said control data to said second communicating means, and
first receiving means for receiving said control data transmitted from said second communicating means,
said second communicating means including
second receiving means including means being controlled, for receiving said control data transmitted from said first communicating means and for controlling said means being controlled in response to said control data, and
second transmitting means for transmitting control state data representing a control state of said means being controlled to said first communicating means, and
each of said plurality of repeater means having an associated identifying code and including
high frequency signal blocking means coupled to said power line for blocking passage of said high frequency signal and for allowing passage of said alternating current,



third receiving means for receiving control data transmitted from one of said first and said second communicating means, coupled to said power line,
identifying code determining means, responsive to the output of said third receiving means, for determining whether the identifying code included in said control data corresponds to the identifying code associated with the repeater means receiving the control data, and for providing an output in response to determining a match between the identifying code included in said control data and the identifying code associated with the repeater receiving the control data,
storing means, responsive to the output signal from said identifying code determining means, for storing said received control data,
identifying signal renewing means, responsive to the output signal from said identifying code determining means, for modifying the identifying code included in the control data stored in said storing means, to a new identifying code identifying an adjacent repeater means, and
third transmitting means for reading the control data stored in said storing means after a lapse of a predetermined time from reception of said control data by said third receiving means, and for transmitting the control data read out of

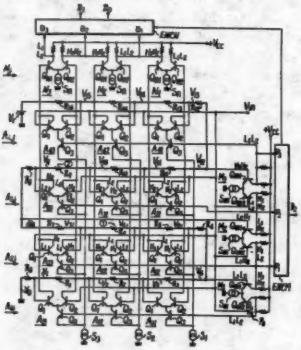
said storing means including the new identifying code renewed by said renewing means.

4,599,599

ANALOG-TO-DIGITAL CONVERTER

Takeo Sekino, Atsugi, and Masashi Takeda, Isehara, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 20, 1982, Ser. No. 400,058
Claims priority, application Japan, Jul. 21, 1981, 56-113901; Nov. 16, 1981, 56-183510
Int. Cl.[4] H03K *5/153*
U.S. Cl. 340—347 AD 25 Claims



1. An analog-to-digital converter for converting an analog input signal to a digital output signal with m upper bits and n lower bits in a single step, comprising:

a plurality of resistor means connected in a series circuit to a voltage source for establishing $(2^{m+n}-1)$ reference voltages at corresponding points on said series circuit;

(2^m-1) upper bit comparators for generating a pluarality of upper output signals indicative of said m upper bits, each upper bit comparator having a first input receiving said analog input signal and a second input connected to a selected one of said points to receive the corresponding reference voltage, adjacent ones of said selected points defining therebetween groups of reference voltages;

upper bit encoder means responisve to said upper output signals for generating said m upper bits;

(2^n-1) lower bit comparators for generating a plurality of lower output signals indicative of said n lower bits and having respective first and second inputs;

lower bit encoder means responisve to said lower output signals for generating said n lower bits; and

switch means including $(2^{m+n}-1)$ switching elements each having a first input receiving said analog input signal and a second input receiving a corresponding one of said reference voltages, the switching elements receiving the reference voltages of said groups constituting corresponding groups of switching elements;

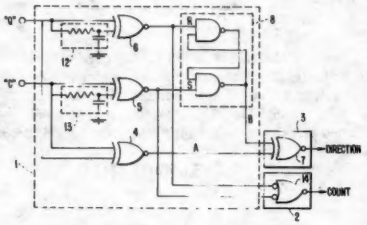
said switch means being responsive to said upper output signals to enable a selected group of switching elements, and said enabled switching elements generating (2^n-1) complementary first and second switching signals supplied to said first and second inputs, respectively, of said (2^n-1) lower bit comparators.

4,599,600

CONVERSION OF QUADRATURE SIGNALS INTO COUNTER CONTROL PULSES

Donald W. McGuire, Dover, and Harry B. Cordes, York, both of Pa., assignors to Red Lion Controls, York, Pa.

Filed Oct. 24, 1983, Ser. No. 544,690
Int. Cl.[4] H03K *5/26*
U.S. Cl. 340—347 P 3 Claims



1. A system for converting a quadrature pulse train into first and second counter control signals comprising:

a transition discriminator which receives said quadrature pulse train composed of a first pulse component and a second pulse component;

said transition discriminator having a first means including a first EX-NOR logic component with one input connected to said first pulse component and the other input connected to said second pulse component; wherein said first means is responsive to said quadrature pulse train to determine the relative state of said first and second pulse components for producing at the output of the first EX-NOR logic component an output of one logic state wherein said first and second pulse components are in the same state and for producing an output of the opposite logic state when said first and second pulse components are not in the same state;

said transition discriminator further having a second means comprising a RS flip-flop which will be in a first logic state when a transition occurs in one of said pulse component means and will be in the opposite logic state when a transition occurs in the other of said pulse component means;

said transition discriminator also having a third means including a second EX-NOR logic component with one input connected to said first pulse component and the other input connected through a first delay unit to said first pulse component and with the output connected to the R input of the RS flipflop, and also including a third EX-NOR logic component with one input connected to said second pulse component and the other input connected through a second delay unit to said second pulse component and with the output connected to the S input of the RS flipflop wherein said third means is responsive to said quadrature pulse train to detect a transition in either of said first or second pulse components;

a direction comparator including a fourth EX-NOR logic unit with one input connected to the output of said RS flip-flop and the other input connected to the output of said first means, said direction comparator being responsive to said first means and to said second means in said transition discriminator means for generating a direction pulse train which has a first logic state when the moving member of the quadrature pulse train generator is traveling in one direction and which has a second logic state when said moving member is traveling in the opposite direction; a pulse generator including a negative connected OR logic unit with one input connected to said third means second EX-NOR logic component output and a second input connected to said third means third EX-NOR logic component output, said pulse generator responsive to the output of said third means in the transition discriminator for generating a count pulse train in which

the number of pulses equals the total number of transitions in said quadrature pulse train;

wherein said first counter control signals are the count pulse train from said pulse generator with a total number of pulses equal to the number of pulse edges in said quadrature pulse train and said second counter control signals are the direction pulse train from said direction comparator which indicate the direction of travel of said moving member of the quadrature pulse train generator.

4,599,601

ABSOLUTE INCREMENTAL ENCODER

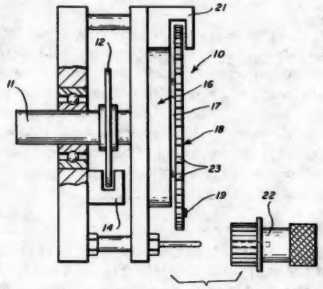
Gert-Dieter Rammelsberg, Munich, Fed. Rep. of Germany, assignor to Litton Precision Products International GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 10, 1984, Ser. No. 629,569

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1983, 3325318

Int. Cl.⁴ H03M 1/24

U.S. Cl. 340—347 P **6 Claims**



1. In an incremental angular encoder;

an encoder shaft,

an output disk coupled for rotation in response to rotation of the encoder shaft,

an absolute zero marking on the output disk,

means for selectively rotating the output disk without causing the rotation of the encoder shaft, and

a scanning device coupled to the housing of the encoder and position to sense the absolute zero marking, the scanning device generating an absolute zero reference signal in response to the sensing of the absolute zero marking.

4,599,602

SERIAL-TYPE A/D CONVERTER UTILIZING FOLDING CIRCUIT CELLS

Akira Matzuzawa, Neyagawa, and Michihiro Inoue, Ikoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 31, 1984, Ser. No. 636,410

Claims priority, application Japan, Aug. 3, 1983, 58-143018; Oct. 7, 1983, 58-186688; Dec. 15, 1983, 58-236660

Int. Cl.⁴ H03M 1/12

U.S. Cl. 340—347 AD **13 Claims**

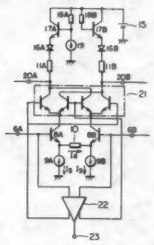
1. A serial-type A/D converter utilizing folding circuit cells connected in cascade wherein each cell has an input terminal and an output terminal, the output terminal of a preceding stage cell being connected to the input terminal of a succeeding stage cell, each of said cells comprising:

differential circuit means having a pair of input terminals, for converting a differential input voltage between said paired input terminals into a differential output current;

load circuit means for converting said differential output current into paired differential output voltages;

comparator means responsive to the polarity of the potential difference between said paired input terminals, said comparator means producing a digital output corresponding to said potential difference;

current switching circuit means connected between said differential circuit means and said load circuit means responsive to the digital output of said comparator means for alternately switching current paths for said differential output current; and



level shifting circuit means for providing output signals at said output terminals by shifting one of said paired differential output voltages.

4,599,603

COMPRESSION TYPE A/D CONVERTER

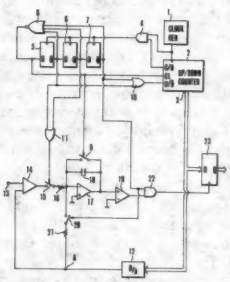
Shinji Sakai; Akira Ishizaki, and Takashi Kawabata, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1984, Ser. No. 597,453

Claims priority, application Japan, Apr. 15, 1983, 58-65184

Int. Cl.⁴ H03M 1/12

U.S. Cl. 340—347 AD **4 Claims**



1. A compression type A/D converter comprising:

(a) input analog signal transmitting means for transmitting an input analog signal;

(b) an integrator;

(c) inverse integration signal generating means for generating an inverse-integrated signal which increases as as a function of a polynomial of order n (where $n \neq 1$) of the inverse integration period;

(d) switching means for connecting said input analog signal transmitting means to said integrator for a predetermined time to effect integrating by said integrator for the predetermined time and then connecting said inverse integration signal generating means with said integrator; and

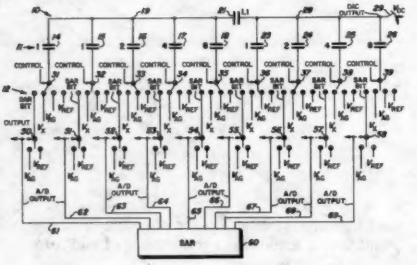
(e) means for converting the time interval from a moment at which said inverse integration signal generating means is connected with said integrator by said switching means to a moment at which the integrated value by said integrator reaches a predetermined level to a digital value.

4,599,604

A/D SELF-TESTING CIRCUIT

James A. McKenzie, and Joe W. Peterson, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 27, 1984, Ser. No. 644,837
Int. Cl.[4] H03M *1/10*
U.S. Cl. 340—347 AD **7 Claims**



1. In an analog to digital converter system having an accurate system reference voltage and a capacitive digital to analog converter having a plurality of rank ordered capacitors, all of the capacitors having a first electrode coupled together for providing an analog output voltage and selectively coupled to a D.C. bias voltage, and each capacitor having a second electrode, a circuit for selectively testing the functionality of the analog to digital converter system by providing a digital output code to be correlated to a digital test code, comprising:

a first plurality of rank ordered switching means, each of said switching means having a first terminal coupled to a predetermined second electrode of the capacitors of corresponding rank, and a second terminal which may be selectively coupled to one of either an unknown analog voltage, the system reference voltage, a second reference voltage or one of a rank ordered plurality of approximation bit terminals, said digital test code selectively controlling each of the first plurality of switching means to selectively switch the second terminal of each switching means to either a full value of the system reference voltage or to the second reference voltage for precharging said capacitors to the digital test code value; and

a second plurality of rank ordered switching means, each of said switching means of the second plurality having a first terminal coupled to a predetermined approximation bit terminal of corresponding rank, and a second terminal which may be selectively coupled to one of either the full value of the system reference voltage or to the second reference voltage in response to a predetermined bit of the digital output code resulting from an approximation of the digital test code.

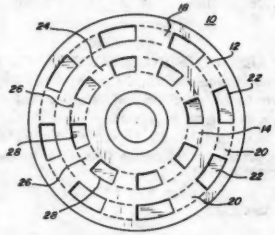
4,599,605

ELECTRICAL ENCODING DEVICE

John W. Froeb, Riverside, and Donald D. Mondul, Wheeling, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 9, 1985, Ser. No. 690,085
Int. Cl.[4] H01H *19/14*
U.S. Cl. 340—347 P **36 Claims**

1. An electrical encoding device for generating a coded input to an electrical apparatus comprising actuation means for effecting actuation of the switching device, fixed contact means for contributing to generation of said coded input and movable contact means for contributing to generation of said coded input in response to said actuator means and in cooperation with said fixed contact means; said fixed contact means comprising a plurality of discrete patterns of fixed contacts arranged in substantially circular arrays oriented substantially concentrically about an axis, at least one of said plurality of discrete patterns comprising a plurality of contact pads electrically in common, respective of said contact pads in each of said at least one of said plurality of discrete patterns being substantially aligned with angularly separated common radii originating from a point on said axis to establish a plurality of sets of said plurality of contact areas, each of said sets being substantially radiallly aligned; said movable contact means comprising



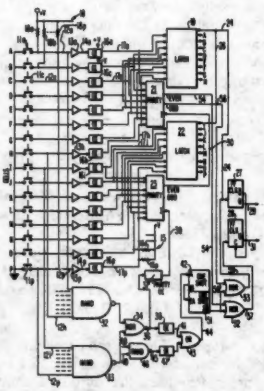
a plurality of electrically common tracking means for establishing a plurality of contact areas between said fixed contact means and said movable contact means, each of said plurality of tracing means being associated with a respective one of said plurality of discrete patterns; said generation of said coded input being effected by appropriate angular displacement of respective pairs of said plurality of tracking means with respective of said sets of said plurality of contact areas.

4,599,606

SYSTEM FOR INPUTTING A SELECTED ONE OF A PLURALITY OF INPUTS TO A COMPUTER

Craig E. Deyer, Akron, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 28, 1982, Ser. No. 402,544
Int. Cl.[4] G06F *3/02*
U.S. Cl. 340—365 S **7 Claims**



1. A logic system and keyboard for inputting a selected one of a plurality of inputs to a computer comprising:

a plurality of switch means equal in number to said plurality of inputs;

latch circuit means having an equal number of input terminals and output terminals, said latch circuit means having a strobe input terminal for receiving a strobe signal, each of said input terminals being responsive to one of said switch means whereby one of said output terminals changes logic state in response to said strobe signal when

one of said switch means is actuated to produce a change of state signal;

sequential logic means responsive to said change of state signal of one of said switch means for providing an actuate signal; and

logic responsive to said actuate signal for providing both said strobe signal to said latch circuit means and a start signal to said computer whereby said change of state of one of said output terminals is input to said computer.

4,599,607

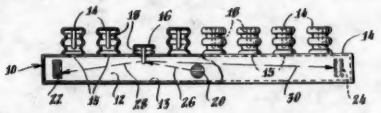
ACOUSTIC KEYBOARD

Lawrence R. Hill, New York, N.Y., assignor to General Instrument Corporation, New York, N.Y.

Filed Oct. 31, 1983, Ser. No. 547,124

Int. Cl.[4] H04L *1/00*

U.S. Cl. 340—365 R **13 Claims**



7. An acoustic keyboard comprising:

a plurality of keys arranged in a matrix;

a plurality of reflector members each associated with a different one of said keys and adapted to project into a detection chamber when its associated key is actuated;

transducer means for emitting acoustic energy into said detection chamber;

detector means for detecting acoustic energy at opposite ends of said detection chamber;

means, coupled to said detector means, for measuring the transit times required for acoustic energy emitted from said transducer means to reflect off of a reflector member projecting into said chamber and travel to said opposite ends of said chamber; and

means, responsive to measured transit times, for identifying individual keys when they are actuated.

4,599,608

CIRCUIT PREVENTING PHANTOM INPUT IN A SWITCH MATRIX

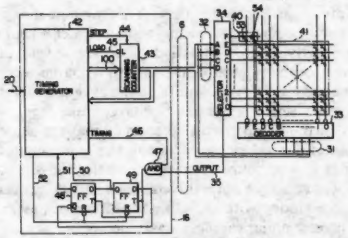
Shigeru Matsuoka, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 21, 1983, Ser. No. 477,373

Claims priority, application Japan, Mar. 19, 1982, 57-42679

Int. Cl.[4] G08C *25/00*

U.S. Cl. 340—365 S **14 Claims**



1. A keyboard circuit including a multiplicity of switches disposed in a matrix connected to associated row lines and column lines, first means for scanning one of the row lines or column lines and establishing a predetermined voltage on the one scanned line, second means for detecting said predetermined voltage from the other one of the scanned row lines or column lines, and recognition means for recognizing the address of an on-state switch from the line addresses of the scanned line in said first means and of the detected line in said second means when the predetermined voltage is detected by said second means comprising:

said multiplicity of switches being disposed in at least two independent submatrices defined in said matrix, the row lines and the column lines of one of the submatrices being different from those of the other of the submatrices; and

means for stopping recognition of a new on-state switch when at least three on-state switches are detected in one submatrix in one scanning.

4,599,609

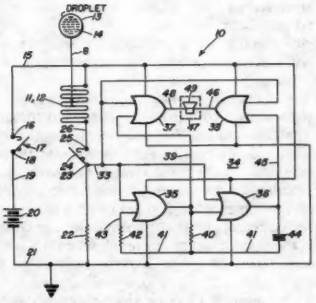
PERSONAL LIQUID CHEMICAL AGENT DETECTOR

William C. Blanchard, Baltimore, Md., assignor to Allied Corporation, Morristown, N.J.

Filed Dec. 5, 1984, Ser. No. 678,538

Int. Cl.[4] G08B *21/00, 17/10*

U.S. Cl. 342—602 **17 Claims**



1. A detector for detecting a liquid wherein the detecfor is attached to clothing of the wearer comprising

a sensor including a conductor of predetermined material having a first and second end, said predetermined material selected to react with said liquid at times said liquid is in contact with said conductor, whereby the resistance of said conductor is changed,

first and second electrical switches having means for attaching said detector to said clothing,

a battery having a first and second terminal, said first terminal coupled through said first switch to said first end of said sensor, said second terminal coupled through a resistor and said second switch to said second end of said sensor,

said common junction of said resistor and said second switch also coupled to a circuit for detecting a predetermined change in said resistance of said conductor and for providing an alarm at times said first and second switch are closed and for testing said circuit at times said first switch is closed and said second switch is open.

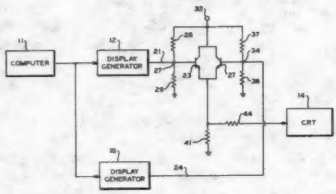
17. A method for testing a personal detector for detecting a liquid where said detector is held to personal clothing by first and second pins also functioning as first and second electrical switches respectively, the first switch coupled between one side of a sensor and one side of a battery and the second switch coupled between the other side of the sensor and a detector and alarm circuit as well as a resistor and a second side of said battery comprising the steps of:

fastening said first switch to cause said alarm circuit to alarm, opening said first switch to cause the alarm to deactivate, fastening said second switch, fastening said first switch to activate said sensor.

4,599,610
OVERLAYING INFORMATION ON A VIDEO DISPLAY

Robert H. Lacy, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 21, 1984, Ser. No. 591,760
Int. Cl.[4] G09G 1/06
U.S. Cl. 340—721 5 Claims



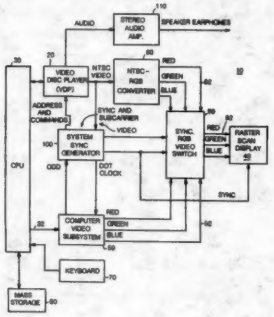
1. Apparatus comprising:
a video display;
a first transistor;
a second transistor;
means for electrically connecting the emitter of said first transistor and said second transistor to ground through a first resistor;
means for electrically connecting the collector of said first transistor to the collector of said second transistor;
means for generating a first video signal and for supplying said first video signal to the base of said first transistor, wherein the voltage at the base of said first transistor is at a first voltage level when it is desired to illuminate a first dot on the screen of said video display in response to said first video signal and is at a second voltage level, which is lower than said first voltage level, when it is not desired to illuminate said first dot in response to said first video signal;
means for generating a second video signal and for supplying said second video signal to the base of said second transistor, wherein the voltage at the base of said second transistor is at a third voltage level when it is desired to illuminate said first dot in response to said second video signal and is at a fourth voltage level, which is lower than said third voltage level, when it is not desired to illuminate said first dot in response to said second video signal and wherein said third voltage level is higher than said first voltage level; and
means for supplying the voltage at the emitter of said first transistor and said second transistor as the video signal to said video display.

4,599,611
INTERACTIVE COMPUTER-BASED INFORMATION DISPLAY SYSTEM

Roger S. Bowker, Wrentham; Linda J. Olsen, Framingham, and Jesse M. Hines, Chelmsford, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 2, 1982, Ser. No. 384,409
Int. Cl.[4] G09G 1/06
U.S. Cl. 340—721 4 Claims

1. An interactive, computer-based system for combining video images from a video source with text and graphics from a computer, comprising:
a display unit;
a central processor unit;
a video subsystem for providing text and graphics signals, in a non-phase-modulated format, responsive to instructions from the central processor unit;
means for converting the video images to video image signals in a non-phase-modulated format if they are not already in that format;
a video switch having a first set of inputs connected to receive the text and graphics signals, a second set of inputs connected to receive non-phase-modulated video image signals, and a set of outputs, the set of outputs being connected to either the first set of inputs or the second set of inputs, pixel-by-pixel, responsive to an attribute of the text and graphic signals; and

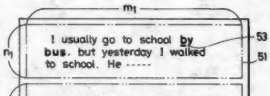


a user input device, such as a keyboard, connected to the central processor unit for allowing a user to supply information to the system.

4,599,612
DISPLAYING AND CORRECTING METHOD FOR MACHINE TRANSLATION SYSTEM

Hiroyuki Kaji, Tama, and Yoshihiko Nitta, Fujisawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 6, 1982, Ser. No. 447,184
Claims priority, application Japan, Dec. 14, 1981, 56-200192
Int. Cl.[4] G09G 1/06; G09B 19/06
U.S. Cl. 340—723 4 Claims


I usually go to school by bus. but yesterday I walked to school. He -----
WATAKUSHI WA BASUNIYOTTE GAKKO E ITSUMO IKU. SHIKASHI WATAKUSHI WA KINOU ARUITA. KARE WA -----

1. A displaying method for a machine translation system, comprising the steps of:
(a) dividing a sentence in a source language into a plurality of source phrasal elements, assigning identifications to the respective source phrasal elements and storing the respective source phrasal elements into a source text area of a memory with said identifications assigned thereto;
(b) separating a sentence in a target language, which has been translated from said source language sentence, into target phrasal elements having the same linguistic meanings as said source phrasal elements, and storing the respective target phrasal elements into a target text area of the memory with the same identifications as assigned to corresponding source phrasal elements;
(c) storing a display start address of a source text, a display start address of a target text, and the identification of a phrasal element to be displayed in a visually distinguishable manner with respect to the other text into a parameter area of the memory;
(d) displaying on a first display area of a screen the text stored in said source text area and displaying on a second

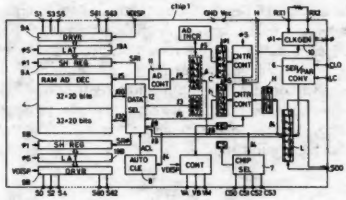
display area of said screen the text stored in said target text area; and

(e) displaying in a visually distinguishable manner with respect to the other text the corresponding phrasal elements of the source text and the target text which have said identification stored in said parameter area of said memory.

4,599,613
DISPLAY DRIVE WITHOUT INITIAL DISTURBED STATE OF DISPLAY

Yoshitaka Fukuma, Yamatokoriyama, and Tosaku Nakanishi, Nishinomiya, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 14, 1982, Ser. No. 417,883
Claims priority, application Japan, Sep. 19, 1981, 56-148101
Int. Cl.⁴ G09G *3/00*
U.S. Cl. 340—784 **5 Claims**



1. A display drive system for driving a flat panel display for displaying desired data, said drive system being responsive to external data provided from an external device, said system comprising:

random access memory means for storing said data to be displayed on said display;

control means for controlling the application of said data to said display from said random access memory means, said control means including a latch means for inhibiting the application of said data to said display when in a first state and for passing said data to said display when in a second state;

disturbed state prevention means for controlling said latch means to selectively inhibit the application of said data to said display, said disturbed state prevention means placing said latch means in the first state to inhibit the application of data to said display upon the initial application of power to said system; and

means for monitoring the processing of data by said control means and for developing a reset signal responsive thereto;

said disturbed state prevention means being responsive to said reset signal developed by said means for monitoring for placing said latch means in said second state to pass data to said display, said latch means including timing means for inhibiting the placing of said latch means in said second state for a predetermined minimum time period.

4,599,614
PHOTOELECTROCHROMIC DISPLAY

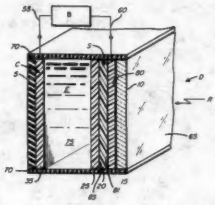
David W. DeBerry, and Alfred Viehbeck, both of Austin, Tex., assignors to SumX Corporation, Austin, Tex.

Filed Sep. 13, 1983, Ser. No. 531,940
Int. Cl.⁴ G09G *3/02*
U.S. Cl. 340—785 **31 Claims**

1. A light addressable photoelectrochromic display apparatus, comprising:

a semiconductor electrode comprising a translucent conductor having a translucent semiconductive substrate formed thereon, said electrode semiconductor generating charge carriers in response to light energy absorbed by said semiconductor; and

an electrochromic substrate formed on said semiconductive substrate, said electrochromic substrate exhibiting a solid

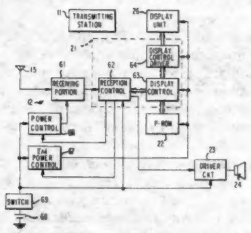


phase electrochemical redox reaction color change in response to said charge carriers, so that an image is formed on said display apparatus by a light activated color change in said electrochromic substrate.

4,599,615
PAGER RECEIVER COMPRISING A MEMORY STORING A SEQUENCE OF INFORMATION SIGNALS TO BE TESTED

Shinjiro Umetsu, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1983, Ser. No. 460,736
Claims priority, application Japan, Jan. 26, 1982, 57-11415; Dec. 6, 1982, 57-213675
Int. Cl.⁴ H04Q *9/00*; H04B *5/04*
U.S. Cl. 340—825.44 **5 Claims**



1. A pager receiver comprising a radio signal receiving portion responsive to a radio calling signal for producing a sequence of demodulated signals, a decoding portion for decoding said demodulated signal sequence to carry out an operation in accordance with said demodulated signal sequence, and a display unit coupled to said decoding portion for providing visual displays when said display unit is driven by said decoding unit, said radio calling signal carrying a test mode signal which is indicative of a test mode and which is demodulated into a specific one of said demodulated signals, said decoding unit comprising:

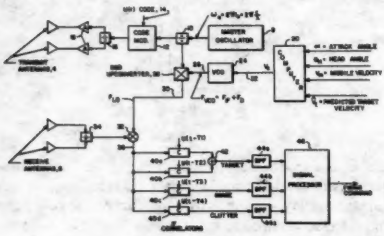
detecting means responsive to said demodulated signals for detecting said specific one of the demodulated signals; and

signal delivery means operatively coupled to said detecting means and said display unit for delivering a test data signal to said display unit in response to said specific one of the demodulated signals so as to test said display unit.

4,599,616
RADAR FUZE SYSTEM

Peter F. Barbella, Littleton, and Ronald A. Wagner, Hudson, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 5, 1983, Ser. No. 512,435
Int. Cl.[4] F42C *13/04*
U.S. Cl. 343—7 PF **6 Claims**



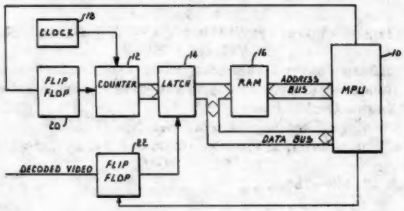
1. A radar fuzing system comprising:
a master oscillator adapted to generate a radio frequency signal,
code modulator means coupled to said master oscillator adapted to modulate said radio frequency signal with a pseudorandom binary code,
means for transmitting said modulated radio frequency signal from said missile,
a voltage controlled oscillator adapted to generate an output signal having a frequency determined by an applied control voltage,
said control voltage being a function of the computed intercept closing velocity between said missile and a target,
signal conversion means for receiving said radio frequency signal and said output signal from said voltage controlled oscillator to form a local oscillator signal,
means for receiving a reflected signal from said target,
means for mixing said local oscillator signal and said reflected signal to provide a code modulated intermediate frequency signal,
first, second, third and fourth intermediate frequency correlator units each adapted to receive said code modulated intermediate frequency signal, and a different time-delayed replica of said pseudorandom binary code,
signal combining means adapted to receive output signals from said first and second correlator units,
first, second and third bandpass filters,
said first bandpass filter being coupled to said combining means to form a target detection channel,
said second bandpass filter being coupled to said third correlator unit to form an image detection channel, and
said third bandpass filter being coupled to said fourth correlator unit to form a clutter detection channel.

4,599,617
METHOD AND APPARATUS FOR EVALUATING THE RANGE DATA ACCUMULATED BY DISTANCE MEASURING EQUIPMENT

James L. Stolpman, Johnson County, Kans., assignor to King Radio Corporation, Olathe, Kans.

Continuation of Ser. No. 275,443, Jun. 19, 1981. This application Sep. 21, 1984, Ser. No. 653,676
Int. Cl.[4] G01S *13/76*
U.S. Cl. 343—7.3 **17 Claims**

1. In a DME of the type adapted to repeatedly transmit interrogation pulse pairs wherein the time interval between the transmission of an interrogation pulse pair is referred to as an interrogation cycle and to receive and decode reply pulses by generating a decoded video pulse each time a pair of reply pulses exhibiting a preselected spacing are received, said reply pulses either being valid replies in response to said transmitted interrogation pulses or invalid replies which originate in response to other interrogations from other DME units or squitter reply pulses, the improvement comprising:
means for producing a range figure corresponding to all decoded video pulses which are generated during a set time period of each interrogation cycle irrespective of the presence or absence of decoded pulses of a preselected number of previous interrogation cycles, each of said

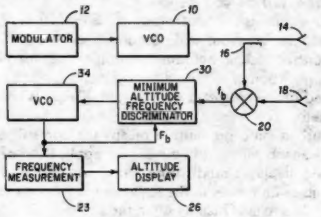


range figures being representative of the interval of time between transmission of the interrogation pulse pair which initiated the interrogation cycle and generation of its associated video pulse;
means for storing all of said range figures; and
processing means for processing and analyzing all of said range figures to determine which of said range figures represent valid replies.

4,599,618
NEAREST RETURN TRACKING IN AN FMCW SYSTEM

Richard S. Haendel, Iowa City, and John C. Wauer, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 26, 1982, Ser. No. 401,804
Int. Cl.[4] G01S *13/32*
U.S. Cl. 343—7.5 **22 Claims**



1. A distance measuring apparatus comprising:
means for generating a variable frequency signal;
means for transmitting said variable frequency signal to a target;
means for receiving a return spectrum of said variable frequency signal reflected from said target; and
means for detecting said return spectrum and providing an output at a predetermined point within said spectrum as a representation of the nearest return.

4,599,619
SATELLITE DUAL ANTENNA POINTING SYSTEM

John E. Keigler, Princeton, and Frank A. Hartshorne, Cinnaminson, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jul. 13, 1982, Ser. No. 397,893
Int. Cl.[4] H04B *7/185*
U.S. Cl. 343—352 **14 Claims**

1. A satellite antenna pointing system comprising:
a satellite having spatially separated transmit and receive communication antenna systems and separate means responsive to transmit antenna pointing control signals and

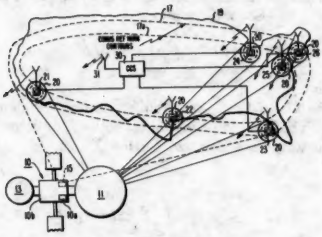
receive antenna pointing control signals for independently pointing said transmit and receive antenna systems, said transmit and receive antenna systems being adapted to provide selective radiation patterns over an overall coverage region,

said satellite further having means for generating a beacon signal,

a broad coverage satellite antenna producing a radiation pattern coverage area on earth including and greater than that of said overall coverage region,

means at said satellite for sequentially applying said beacon signal to said broad coverage antenna, said transmit antenna system and said receive antenna system,

a plurality of peripheral ground stations located near the periphery of said overall coverage region and at the position of the desired patterns, each of said ground stations adapted to receive said beacon signals,



means for comparing said beacon signals from said broad coverage antenna and said transmit antenna systems for producing a first signal and means for comparing said beacon signals from said broad coverage antenna and said receive antenna system for producing a second signal,

means responsive to said first signals from said plurality of peripheral ground stations for producing said first transmit antenna pointing control signal and responsive to said second signals from said plurality of peripheral ground stations for providing said receive antenna pointing control signals, and

means for applying said transmit antenna pointing control signal and said receive antenna pointing control signal to said separate pointing means at said satellite for independently pointing said transmit and receive antenna systems.

4,599,620

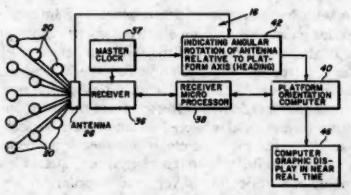
METHOD FOR DETERMINING THE ORIENTATION OF A MOVING PLATFORM

Alan G. Evans, LaPlata, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 4, 1984, Ser. No. 678,187

Int. Cl.[4] G01S 5/02; H04B 7/185; G06G 7/78

U.S. Cl. 343—357 **16 Claims**



1. A method for continuously determining the orientation of a moving user platform at a selected time fix and in relation to the earth's ellipsoid, the platform being generally comprised of a rotating antenna, a receiver and processor means; the antenna being connected to the receiver and the processor means being operatively associated with the receiver, the method comprising the steps of:

continuously transmitting encoded RF signals from a plurality of Global Positioning System (GPS) earth-orbiting satellites, such that the transmitted RF signals of each GPS earth-orbiting satellite are a pair of encoded RF signals at predetermined frequencies that are directed in a radial direction towards the earth's surface, all GPS satellites of the plurality of satellites progressively and continuously advancing in their respective orbits about the earth in relation to the moving user platform;

continuously processing the encoded RF signals of a series of GPS satellites of the plurality thereof wherein the series of satellites are in the field of view of the antenna and wherein the signals of the satellites of the series are received by the antenna so that the receiver and processor means select and continuously track the signals of an optimum group of four satellites of the series,

selecting a series of four equidistant peripheral points about the rotating antenna and at the same time receiving signals from each optimum-tracked satellite so as to obtain a plurality of graphically-displayed biased range data points for each optimum-tracked satellite wherein a graphically displayed range data point of an optimum-tracked satellite indicates a biased range of the optimum-tracked satellite with respect to one of the equidistant peripheral points of the series thereof,

forming a series of four relatively spaced lines in relation to the graphically displayed biased range data points for each optimum-tracked satellite, wherein each line of the series extends between at least two biased range data points of the graphic display of an optimum-tracked satellite where two such data points are with respect to signals received from the optimum-tracked satellite at the same point of the selected series of equidistant points,

selecting a common time fix in near real time between the graphic displays of each optimum-tracked satellite and then extending a line along the common time fix between the series of spaced lines of each graphic display so as to define a common point between the common time fix line and each spaced line of a graphic display.

analytically determining by interpolation the change-in-range of each optimum-tracked satellite with respect to at least one pair of diametrically opposed points of a series of four equidistant peripheral points about the antenna by selecting a pair of common points of the graphic display of an optimum-tracked satellite wherein the selected pair of common points relates to one pair of diametrically-opposed points of the series of four equidistant points about the antenna, and wherein the difference between the selected pair of common points indicates the change-in-range of the optimum-tracked satellite of a graphic display with respect to the associated pair of diametrically opposed points of the antenna. and

further determining the pitch, roll, and yaw of the rotating antenna at the selected time fix in relation to a reference plane of the antenna by using predetermined arithmetic equations that are functions of the change-in-range of each optimum-tracked satellite so as to indicate the orientation of the platform at the selected time fix.

4,599,621

TWO-FREQUENCY GLIDE-PATH STATION FOR THE STANDARDIZED INSTRUMENT-LANDING SYSTEM ILS

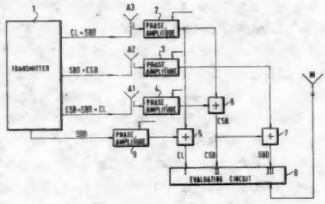
Helmüt Raiisch, Schwieberdingen, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sep. 7, 1984, Ser. No. 648,853

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332541

Int. Cl.[4] G01S 1/16

U.S. Cl. 343—410 1 Claim



1. Two-frequency glide-path station for the standardized instrument-landing system ILS comprising several antennas (A1, A2, A3) which radiate sum signals (CSB+SBO+CL; SBO+CSB; CL+SBO) whose superposition in space gives course and clearance signals, and a facility for monitoring the radiated signals, the monitoring of the course line being performed with a monitor antenna (M) in the near field which is followed by an evaluating unit, and the monitoring of the course width being performed by extracting a portion of each of the sum signals fed to the antennas of the glide-path station and evaluating said portions, characterized in that the extracted portions of the sum signals and a sideband signal (SBO) extracted directly from the transmitter (1) are so combined (5, 6, 7) that further signals (CL, SBO, CSB) are obtained which, except for their amplitudes, are equal to the signals forming the sum signals, and that said further signals are evaluated in an evaluating circuit (8) for monitoring their prescribed values.

4,599,622

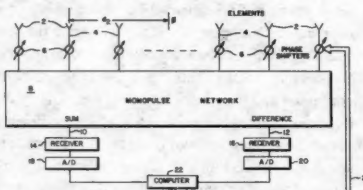
PHASE ONLY ADAPTIVE NULLING IN A MONOPULSE ANTENNA

Randy L. Haupt, Stow, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 11, 1984, Ser. No. 629,926

Int. Cl.[4] G01S 5/02, 3/16

U.S. Cl. 343—427 1 Claim



1. A method for phase-only adaptive nulling in a monopulse radar system having a phased array antenna, said phased array antenna comprising a multiplicity of equally spaced antenna elements with phase shifters; a sum channel means and a difference channel means connected to receive radar signals from said antenna and transmit sum and difference signals to radar receiver means, and computer means, said computer means providing phase shifter setting values for steering said antenna, comprising the steps of:

(a) determining the sum channel output power S0 and the difference channel output power D0;

(b) changing the phase of the signal at a phase element i by ΔPH, where ΔPH is a constant representing the smallest incremental phase change of said phase shifter;

(c) determining the new sum channel output power NEWSUM$_i$ and the new difference channel output power NEWDIF$_i$;

(d) calculating the change in the output power factor PWR$_i$ for each phase element in accordance with a first equation:

$$\Delta PWR_i = [(NEWSUM_i \times NEWDIF_i) - (S0 \times D0)]^{\frac{1}{2}}$$

(e) repeating steps (a) to (d) for phase element i=1;

(f) when i equals N+1, where N equals the number of said phase shifters in said array, calculating the adaptive phase changes for the signals at each said phase element according to a second equation:

$$WNEW_i = WOLD_i - \mu(\Delta PWR_i/\Delta PH)$$

where

WNEW$_i$=new phase shifter setting for element i

WOLD$_i$=old phase shifter setting for element i

μ=gradient step size $\Delta PH^2/TP$

$$TP = \left(\sum_{i=1}^{N} \Delta PWR_i^2\right)^{\frac{1}{2}}$$

ΔPH=phase setting step size in least significant bits

ΔPWR$_i$=change in output power due to adding ΔPH to phase shifter i

(g) determining the output power S1 from the sum channel and the output power D1 from the difference channel;

(h) substituting the value of S1 for the value of S0 and the value D1 for the value of D0 in said first equation in step (d) if the value of S1+D1 is greater than the value of S0+D0 and repeating steps (a) through (g); and

(i) decrementing the value of ΔPH by one least significant bit;

(j) repeating steps (a) through (g) if the value of ΔPH is greater than zero; and

(k) terminating said method if the value of ΔPH is equal to zero.

4,599,623

POLARIZER REFLECTOR AND REFLECTING PLATE SCANNING ANTENNA INCLUDING SAME

Michael Havkin, 14 Hanassi Harishon, Rehovot; Eda Orleansky, 7 Hagidud Haivri, Rishon LeZion, and Claude Samson, 3 Savion Street, Rehovot, all of Israel

Filed Jun. 30, 1983, Ser. No. 509,778

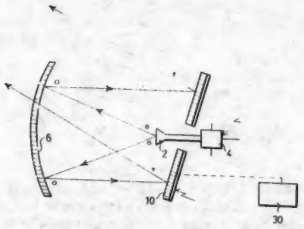
Claims priority, application Israel, Jul. 15, 1982, 66327

Int. Cl.[4] H01Q 19/95, 19/18

U.S. Cl. 343—756 9 Claims

1. A wide band-width reflecting plate type antenna, comprising feeder means for feeding electromagnetic radiation; a front reflector disposed in front of the feeder means and illuminated by the electromagnetic radiation fed therefrom; and a back reflector disposed behind the front reflector for receiving the electromagnetic radiation reflected from the the front reflector and for producing a reflected beam which is polarized at a right angle to the incident electromagnetic radiation received from the front reflector; characterized in that said back reflector includes a reflecting layer, and a polarizer on the side thereof facing said front reflector, which polarizer includes means effective to convert substantially the entire energy of the incident electromagnetic radiation during its propagation forwardly through the polarizer to the reflecting layer, from linear polarization to circular polarization, and to reconvert

substantially the entire energy of the electromagentic radiation reflected from said reflecting layer, during its propagation back through the polarizer, from circular polarization to linear polarization, but at a right angle to the incident electromagnetic radiation and whereby the phase delay between the polarizer and the reflecting layer does not affect the predetermined angle of rotation which is defined solely by the polarizer and wherein consequently the rotation through the predetermined angle takes place over a relatively wide band of frequencies.



4,599,624

ATMOSPHERIC PRESSURE CHAMBER IN AN INK JET SYSTEM PRINTER

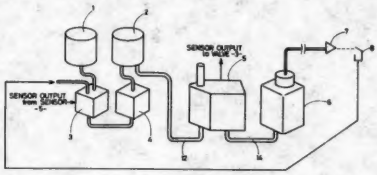
Masahiko Aiba, Nara; Masaaki Kuranishi, Yamatokoriyama, and Hideyuki Miyake, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 17, 1984, Ser. No. 571,670

Claims priority, application Japan, Jan. 18, 1983, 58-6171[U]

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—75 **3 Claims**



1. An ink liquid supply system for an ink jet system printer of the charge amplitude controlling type comprising:

an ink tank containing a water-color ink therein;

a dilution tank containing a diluting liquid therein;

pressurizing pump means for receiving said water-color ink from said ink tank via said atmospheric pressure chamber and for developing pressurized ink;

a nozzle unit connected to said pressurizing pump means for receiving said pressurized ink and developing ink droplets therefrom;

beam gutter means for collecting ink droplets not contributing to the actual printing operation;

valve means for selectively connecting said ink tank to said dilution tank or said beam gutter means; and

an atmospheric pressure chamber interposed between said ink tank and said pressurizing pump means via two respective conduits, said atmospheric pressure chamber including

an ink chamber containing ink at atmospheric pressure therein supplied from said ink tank;

an air buffer immersed in said ink at atmospheric pressure contained in said ink chamber, said air buffer having a resilient tubular wall with an opening at only one end thereof defining an air chamber therein wherein said air buffer absorbs expansion of said ink liquid in said atmospheric pressure chamber by expelling said air at atmospheric pressure to the exterior of said chamber; and

air inlet means disposed in a base layer of said atmospheric pressure chamber for communicating said air chamber with the atmosphere at said open end thereof.

4,599,625

INK TANK FRANGIBLE LEVER FOR PRESSURE CO-ACTION WITH A INK BAG

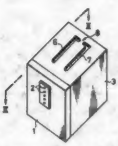
Koji Terasawa, Mitaka; Akira Miyakawa, Tanashi, and Takehiko Kiyohara, Zama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

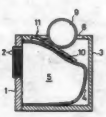
Filed Mar. 20, 1985, Ser. No. 713,883

Claims priority, application Japan, Mar. 30, 1984, 59-60588; Mar. 30, 1984, 59-60589

Int. Cl.[4] G01D *15/18;* **B65D** *35/56*

U.S. Cl. 346—140 R **18 Claims**





1. An ink tank comprising a deformable ink bag for storing ink provided in a case, wherein a low strength portion is formed in a member constituting said case, and a lever for pressing said ink bag is formed by breaking said low strength portion.

4,599,626

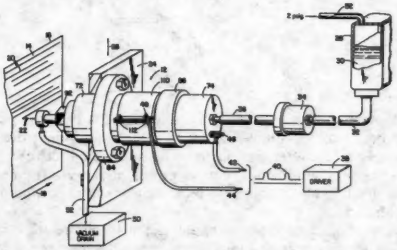
INK DROP EJECTING HEAD

Leonard G. Rich, West Hartford, Conn., assignor to Metromedia, Inc., Secaucus, N.J.

Filed Aug. 2, 1984, Ser. No. 637,163

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R **4 Claims**



1. An ink drop ejecting head for an ink jet printing system, said head comprising a tubular section of piezoelectric material having internal and external cylindrical surfaces and which expands and contracts to vary its internal volume in response to changes in the electrical potential appearing across said internal and external surfaces, said tubular section having open forward and rear ends, a forward closure member connected

to said tubular section and closing its forward end, a rear closure member connected to said tubular section and closing its rear end, the interior of said tubular member as closed by said front and rear closure members providing an ink chamber for containing ink to be ejected, nozzle means associated with said forward closure member forming an ejection port and an outlet passage extending through said forward closure member between said ink chamber and said ejection port, inlet means associated with said rear closure member and providing an inlet port and an inlet passage extending through said rear closure member between said inlet port and said ink chamber, said forward closure member being connected to said tubular section by releasable connecting means and said rear closure member also being connected to said tubular section by releasable connecting means whereby said forward and rear closure members may both be disassembled from said tubular section, said means for releasably connecting said forward closure member to said tubular section including a forward annular ring bonded to said tubular section, said annular ring being located adjacent the forward end of said tubular section and extending radially outwardly from said external surface of said tubular section, and threaded connecting means engageable with said forward annular ring and said forward closure member for threadably holding said forward annular ring and said forward closure member in connected relationship, and said means for releasably connecting said rear closure member to said tubular section including a rear annular ring bonded to said tubular section, said rear annular ring being located adjacent the rear end of said tubular section and extending radially outwardly from said external surface of said tubular section, and threaded connecting means engageable with said rear annular ring and said rear closure member for threadably holding said rear annular ring and said rear closure member in connected relationship.

4,599,627

APPARATUS AND METHOD FOR INK JET PRINTER

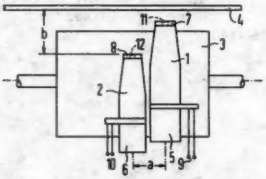
Emmeran Vollert, Grosshoehenrain, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 31, 1984, Ser. No. 646,202

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1983, 3332491

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—140 R **11 Claims**



1. Apparatus for an ink jet printer using a two-component writing fluid for quick drying in which individual droplets forming a character are ejected from individual jets of a print head under the influence of drive pulses, and means for moving said print head relative to a recording medium, including, in combination;

further ejection apparatus mounted in spaced relationship to said print head and movable therewith, separate reservoirs provided for ink for said print head and drying liquid for said ejection apparatus for separately storing said ink and said drying liquid as first and second individual liquid components of said writing fluid, one of said reservoirs containing ink and the other reservoir containing drying liquid, and means for discharging said second liquid component from said ejection apparatus at a time which is offset relative to the ejection of the first liquid component contained in the reservoir of the print head, said second liquid component being ejected from said ejection apparatus to cover only the region of said recording medium which receives the representation of a character from said print head.

4,599,628

MICROPLANAR INK-JET PRINTING HEAD

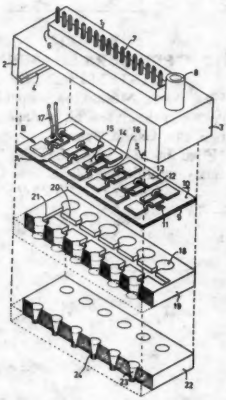
Michael Doring; Horst K. Bentin, and Herman F. L. Maier, all of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 19, 1984, Ser. No. 672,513

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 3342844

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R **14 Claims**



1. An ink-jet printing head comprising:

a body having first and second opposite sides and a plurality of ink ducts extending therethrough,

a corresponding plurality of nozzles each communicating with a respective duct,

a corresponding plurality of pressure chambers, each having a given respective cross-sectional area and communicating with a respective duct,

a common ink supply system connected to said ducts,

a common diaphragm plate, and a one-piece piezoceramic plate connected to said diaphragm plate and having a respective embossed part disposed above the area of each pressure chamber, and

a corresponding plurality of film-shaped electrodes, each overlying a respective embossed part and having a respective electrical connection,

characterized in that each said embossed part extends beyond the area of the respective pressure chamber, and

said electrical connections are connected to the respective electrodes outside the area above the respective pressure chambers,

whereby a mass of the electrical connections does not affect the resonant frequency of the respective embossed part and pressure chamber.

4,599,629

MAGNETIC INK DOT PRINTER WITH MEANS FOR CONTROLLING PRINT DENSITY

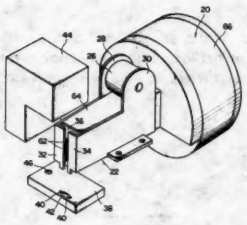
Takeyoshi Tsuge; Yoshihiro Torisawa; Ayumu Makino, all of Mishima, Japan, and Tsutomu Kimura, deceased, late of Mishima, Japan (by Shizuko Kimura, legal representative), assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1984, Ser. No. 617,360

Claims priority, application Japan, Jun. 10, 1983, 58-103959; Jun. 21, 1983, 58-111681

Int. Cl.[4] G01D 15/16

U.S. Cl. 346—140 R 15 Claims



1. An ink dot printer comprising:

a means for storing magnetic ink;

a pair of magnetic pole plates arranged opposite to each other to form a slit, whose one end is immersed in the magnetic ink supplied from the magnetic ink storing means;

a magnetism generating means including an electro magnet for magnetizing the paired magnetic pole plates to introduce the magnetic ink supplied from the magnetic ink storing means into the slit to form a magnetic ink film therein;

a plurality of needles arranged adjacent to one another in the longitudinal direction of the slit and each freely movable in the longitudinal direction of the needle between a first position where its one end portion is immersed in the magnetic ink film in the slit between the paired magnetic pole plates and a second position where its one end portion is projected from the magnetic ink film in the slit;

a driving means for selectively driving the needles to move them from the first to the second position; and

a magnetic force control means for controlling the strength of magnetic force generated by the magnetism generating means by controlling current or voltage supplied to said electromagnet, wherein the magnetic force control means has an automatic print density maintaining means, which reads the density of dots on the recording paper, compares it with the reference density previously set, and controls current or voltage supplied to the electromagnet on the basis of a value obtained by comparing the densities, thereby to control the strength of the magnetic force generated by the electromagnet and maintain the density of the dots formed on the recording paper equal to the reference density;

wherein the single or plural needles selected force the magnetic ink, which has been stuck to their one ends at the first position, onto a recording paper at the second position to form dots of magnetic ink, by the gathering of which symbols, such as characters and numerals are printed.

4,599,630

TWO-COLOR THERMOSENSITIVE RECORDING MATERIAL

Kazumi Ohtaki, and Hiroshi Sakamoto, both of Numazu, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 9, 1984, Ser. No. 669,838

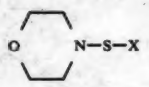
Claims priority, application Japan, Nov. 15, 1983, 58-214747; Nov. 15, 1983, 58-214748

Int. Cl.[4] B41M 5/18, 5/22

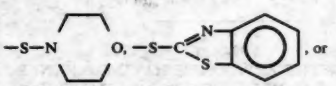
U.S. Cl. 346—204 14 Claims

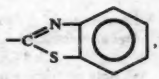
1. In a two-color thermosensitive recording material capable of forming two different colors when heated at different temperatures, comprising a support material, a high-temperature color-forming layer formed on said support material, a decolorization layer overlaying said high-temperature color-forming layer, and a low-temperature color-forming layer overlaying said decolorization layer, said high-temperature color-forming layer being capable of forming color when heated at a predetermined coloring temperature, said low-temperature color-forming layer being capable of forming color which is different from the color formed by said high-temperature color-forming layer when heated at a predetermined coloring temperature which is lower than said coloring temperature for said high-temperature color-forming layer, and said decolorization layer being capable of decolorizing the color developed in said low-temperature color-forming layer when heated up to a predetermined temperature for preventing the color developed in said low-temperature color-forming layer being mixed with the color developed in said high-temperature color-forming layer, the improvement wherein said high-temperature color-forming layer comprises a first leuco dye and a color developer capable of inducing color formation in said first leuco dye upon application of heat thereto, said decolorizing layer comprises a decolorizing agent selected from the group consisting of aliphatic amines and morpholine derivatives represented by general formula (Ia), (Ib) and (Ic),

(Ia)

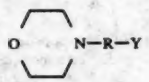


wherein X represents

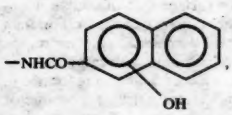




(Ib)



wherein Y represents



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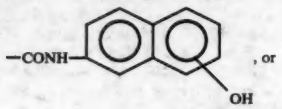
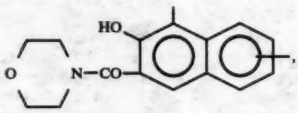


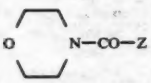
, or



,

and R represents alkylene,

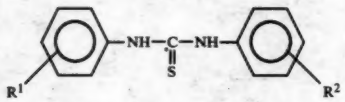
(Ic)



wherein Z represents

or higher alkyl, said low-temperature color-forming layer comprises a second leuco dye and a thiourea derivative of general formula (II) serving as a color developer capable of inducing color formation in said second leuco dye upon application of heat thereto,

(II)



wherein R^1 and R^2 each represent hydrogen, halogen, trifluoromethyl or alkyl having 1 to 4 carbon atoms.

4,599,631

SEMICONDUCTOR APPARATUS HAVING A ZENER DIODE INTEGRAL WITH A RESISTOR-TRANSISTOR COMBINATION

Mitsuo Tsuzuki, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Oct. 5, 1983, Ser. No. 539,138
Claims priority, application Japan, Oct. 12, 1982, 57-178807
Int. Cl.⁴ H01L *29/90*
U.S. Cl. 357—13 **9 Claims**

1. A semiconductor apparatus comprising: a semiconductor substrate of one conductivity type;

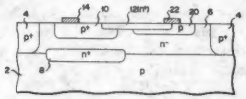
a semiconductor layer of an opposite conductivity type formed on said semiconductor substrate;

a first and a second semiconductor region of said one conductivity type separately formed in the surface area of said semiconductor layer, apart from each other;

a third semiconductor region of the opposite conductivity type which is formed in the surface area of said semiconductor layer and has a higher impurity concentration than said semiconductor layer, said third semiconductor region being formed in a contact relationship with respect to said first semiconductor region, a Zener diode being formed in the junction between said first and third semiconductor regions; and

connecting means for electrically connecting said second and third semiconductor regions;

wherein said second semiconductor region, semiconductor layer and semiconductor substrate constitute a transistor;



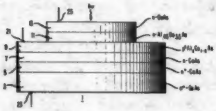
and wherein that portion of said third semiconductor region which lies between said connecting means and said first semiconductor region acts as a resistor.

4,599,632

PHOTODETECTOR WITH GRADED BANDGAP REGION

Clyde G. Bethea, Plainfield; Federico Capasso, Westfield; Albert L. Hutchinson, Piscataway; Barry F. Levine, Livingston, and Won-Tien Tsang, New Providence, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 30, 1982, Ser. No. 412,786
Int. Cl.⁴ H01L *27/14*
U.S. Cl. 357—30 **10 Claims**



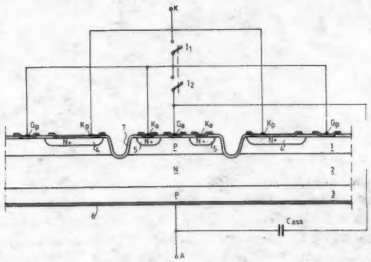
1. A photodetector comprising a first semiconductor region having a first conductivity type and a first bandgap; a second semiconductor region having a second conductivity type; and a third semiconductor region having a first conductivity type and a second bandgap; said second region contacting said first and said third regions, said first bandgap being less than or equal to said second bandgap, said second region having a bandgap graded from a first value adjacent to said third region to a second value adjacent to said first region, said first value being greater than said second value; at least one of said second and first regions being radiation sensitive, and electrical contacts to said first and said third regions.

4,599,633

INTEGRATED SELF-FIRING AMPLIFIED THYRISTOR STRUCTURE FOR ON/OFF SWITCHING OF HIGH CURRENTS AND CONTROL CIRCUIT THEREOF

Jacques Thire, Caen, and Georges Souques, Paris, both of France, assignors to La Telemecanique Electrique, France

PCT No. PCT/FR84/00047, § 371 Date Oct. 18, 1984, § 102(e) Date Oct. 18, 1984, PCT Pub. No. WO84/03588, PCT Pub. Date Sep. 13, 1984
PCT Filed Mar. 1, 1984, Ser. No. 675,924
Claims priority, application France, Mar. 1, 1983, 83 03306
Int. Cl.[4] H01L *29/74*
U.S. Cl. 357—38 7 Claims



1. An integrated self-firing thyristor structure comprising

(i) a main thyristor having

a first emitter portion;

a main base carried by said first emitter portion;

a first inhibition base carried by said main base and traversed through by a small sized central bore having an inner surface;

a second emitter portion carried by said first inhibition base and forming therewith a first base-emitter junction;

(ii) an auxiliary thyristor using said first emitter portion and said main base and further comprising a second inhibition base carried by said main base, said second inhibition base extending into said bore and having a peripheral surface, a cenntral portion and a peripheral portion, and a third emitter portion carried by said central portion of the second inhibition base and forming therewith a second base-emitter junction;

(iii) a groove completely surrounding said second inhibition base and formed between said inner surface and said peripheral surface, said groove being adapted to have between said first inhibition base and said second inhibition base a resistance, the value of which is at least of the order of a megohm;

(iv) a first contact element electrically connected to said first emitter portion and constituting the anode of the integrated thyristor structure, a second contact element electrically connected to said second emitter portion and constituting the cathode of the integrated thyristor structure, a third contact element electrically connected to said third emitter portion, a fourth contact element electrically connected to the second inhibition base and a fifth contact element electrically connected to said first inhibition base;

(v) a conductive element connecting therebetween said third contact element and said fifth contact element;

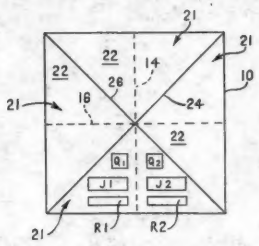
(v) a first switching circuit connected between said conductive element and said fourth contact element and a second switching circuit connected between said conductive element and said second contact element.

4,599,634

STRESS INSENSITIVE INTEGRATED CIRCUIT

Daniel D. Culmer, Sunnyvale, and Robert A. Cometta, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 15, 1978, Ser. No. 933,867
Int. Cl.[4] H01L *27/04*
U.S. Cl. 357—40 15 Claims



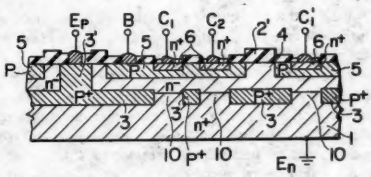
1. In a linear integrated circuit including a plurality of surface effect circuit elements having a critical ratio relationship in operating characteristics between at least some of said plurality of surface effect circuit elements, said circuit elements being formed in a common semiconductor substrate, which substrate has a mechanical stress which is symmetrical about at least one given axis, said surface effect circuit elements exhibiting a change in operating characteristics in response to the mechanical stress, the improvement which comprises arranging at least those of said plurality of surface effect circuit elements having a critical ratio relationship and exhibiting the changes in operating characteristics as a result of the mechanical stress symmetrically about the axis of mechanical stress symmetry.

4,599,635

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE AND METHOD OF PRODUCING SAME

Kazuo Itoh, Kodaira; Katsumi Ogiue, Tokyo, and Akio Hayasaka, Yamato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 608,734, Aug. 28, 1975, abandoned. This application Nov. 18, 1977, Ser. No. 852,978
Int. Cl.[4] H01L *27/04*; H03K *19/091*
U.S. Cl. 357—44 15 Claims



1. A semiconductor device comprising:

a semiconductor layer of a first conductivity type;

a first semiconductor region of a second conductivity type, opposite to said first conductivity type, formed on said semiconductor layer;

a second semiconductor region of the second conductivity type closely spaced from, and extending beneath part of, said first region so as to constitute a transistor together with said semiconductor layer and said first region;

a plurality of third semiconductor regions of the first conductivity type each formed on said first region so as to be spaced from each other, and extending over part of said

semiconductor layer other than that below which said second region extends, said plurality of third regions constituting a multi-collector transistor together with said semiconductor layer and said first region; and

said semiconductor layer containing at least one heavily doped region extending beneath said plurality of third regions so that part of said semiconductor layer located beneath said third regions operates as an emitter for said multi-collector transistor.

4,599,636

TWO TERMINAL AXIAL LEAD SUPPRESSOR AND DIODE BRIDGE DEVICE

Ronald L. Roberts, Scottsdale, and Willard E. Payne, Mesa, both of Ariz., assignors to General Semiconductor Industries, Inc., Tempe, Ariz.

Filed Mar. 8, 1984, Ser. No. 587,392
Int. Cl.[4] H01L 23/32
U.S. Cl. 357—76 **11 Claims**

11. An axial lead semiconductor device including in combination:

(a) first, second, third and fourth semiconductor chips connected to form a circuit;

(b) first and second axial lead elements each including a lead wire section and a paddle section with a flat surface;

(c) first conductive means for attaching a terminal of said first semiconductor chip to said paddle section of said first axial lead element;

(d) second conductive means for attaching a terminal of said second semiconductor chip to said paddle section of said first axial lead element;

(e) third conductive means for attaching a terminal of said third semiconductor chip to said paddle section of said second axial lead element;

(f) first conductive cantilever means supported at a first end thereof by said first and third chips for supporting said fourth semiconductor chip at the other end thereof;

(g) second conductive cantilever means supported at a first end thereof by said second semiconductor chip for supporting said fourth semiconductor chip at a second end thereof;

(h) fifth conductive means for attaching predetermined terminals of said first and third semiconductor chips to said first end of said first conductive cantilever means;

(i) sixth conductive means for attaching predetermined terminals of said third semiconductor chip to said first end of said second conductive cantilever means;

(j) seventh conductive means for attaching a first electrode of said fourth semiconductor semiconductor chip to the second end of said first conductive cantilever means; and

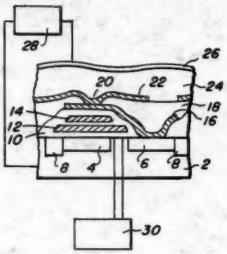
(k) eighth conductive means for attaching a second electrode of said fourth semiconductor semiconductor chip to the second end of said second conductive cantilever means.

4,599,637

SOLID STATE IMAGING DEVICE WITH PHOTOCONDUCTIVE LAYER

Takao Kon, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 26, 1984, Ser. No. 604,196
Claims priority, application Japan, Apr. 26, 1983, 58-72091
Int. Cl.[4] H01L 27/14, 31/00, 29/78
U.S. Cl. 357—30 **3 Claims**



1. A solid state imaging device comprising:

a semiconductor substrate having charge storage sections and charge transferring sections;

a photoconductive layer provided on said semiconductor substrate for converting incident light into signal charges;

a transparent electrode provided on said photoconductive layer;

a means for applying voltage to said transparent electrode after said signal charges in said storage sections are transferred to said charge transferring sections, said voltage causing a release of trapped charges in said photoconductive layer to said transparent electrode; and

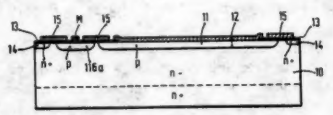
a clock generator for generating reading pulses enabling to transfer said signal charges in said storage sections to said transferring sections.

4,599,638

PLANAR SEMICONDUCTOR STRUCTURE BREAKDOWN VOLTAGE PROTECTION USING VOLTAGE DIVIDER

Peter Flohrs, Reutlingen-Betzingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE82/00175, § 371 Date Sep. 15, 1983, § 102(e) Date Sep. 15, 1983, PCT Pub. No. WO83/02529, PCT Pub. Date Jul. 21, 1983
PCT Filed Sep. 3, 1982, Ser. No. 541,333
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1982, 3201545
Int. Cl.[4] H01L 27/02
U.S. Cl. 357—51 **11 Claims**



1. A planar semiconductor structure having a monocrystalline semiconductor chip (10) of a basic material having a specific conductivity type and having a main surface,

a first zone (11), of the opposite conductivity type, introduced by diffusion into the first semiconductor chip (10) from one main surface, which first zone, together with the basic material making up the semiconductor chip (10), prior to said diffusion, forms a first p-n junction (12) having a line of intersection with said main surface,

a second, annular zone (14), of the same conductivity type as

the basic material making up the semiconductor chip (10) but having a higher concentration of impurities, introduced around the first zone (11) by diffusion into the semiconductor chip (10) from said main surface,

a passivation layer (13) covering said main surface of the semiconductor chip (10) except for contact windows (301, 302, 303) disposed respectively on each of said first (11) and second (14) zones,

a metallizing coating (15), annularly surrounding the first p-n junction (12) and overlapping the line of intersection thereof with said one main surface of the semiconductor chip (10), applied, acting as a cover electrode (15), to the passivation layer (13), the metallizing coating extending across said one main surface as far as a region of said one main surface adjacent to the annular zone (14), and

wherein, in accordance with the invention,

the second annular zone (14) acts as a stop-ring and is completely covered by the passivation layer (13),

a voltage divider (16) is provided, for adjusting the potential of the cover electrode (15) to a value which is substantially constant over the region of the cover electrode such that said value falls in a range between a potential of the first zone (11) and a potential of a portion of the semiconductor chip (10) located outside of the first zone (11), said portion having a conductivity type opposite that of the first zone (11), said voltage divider (16) including a voltage divider resistor (16*a*) having first (19) and second (20) ends, and a tap (16*b*) connected to the cover electrode (15),

the first end (19) of the voltage divider resistor (16*a*) is connected with the first zone (11); and

the second end (20) of the voltage divider resistor (16*a*) is connected (M1, M2; B1, B2) on said main surface with said portion of the semiconductor chip (10) located outside the first zone (11) and having a conductivity type opposite that of the first zone (11).

4,599,639

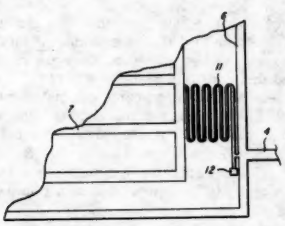
PROCESS PROTECTION FOR INDIVIDUAL DEVICE GATES ON LARGE AREA MIS DEVICES

Jaroslav Hynecek, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 365,077, Apr. 19, 1982. This application Mar. 19, 1984, Ser. No. 590,949

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.13 **4 Claims**



1. A semiconductor device with insulated gates comprising:

(a) a semiconductor substrate;

(b) a plurality of scribe lines on said substrate in a rectangular matrix arrangement defining a plurality of rectangles, each rectangle including:

(c) a gate insulated from said substrate;

(d) a resistor coupled between each said gate and said substrate; and

(e) a gate interconnection coupled to said resistor, extending across said scribe line and coupled to a resistor of a contiguous rectangle.

4,599,640

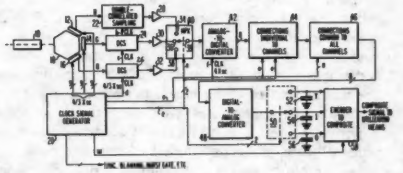
TELEVISION CAMERA WITH MULTIPLEXED A-D CONVERTER

Robert A. Dischert, Burlington, N.J., assignor to RCA Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 584,861, Feb. 29, 1984, abandoned. This application Jul. 30, 1984, Ser. No. 635,831

Int. Cl.⁴ H04N *9/09*

U.S. Cl. 358—50 **11 Claims**



10. Digital signal processing apparatus for a color television camera comprising:

a plurality, N, of solid-state imagers, each responsive to a different color component of a light image simultaneously incident thereon and each further including a readout portion from which analog image-representative signals representative of the same portion of said incident light image are controllably supplied in response to the application to said readout portion of imager clock signals;

analog-to-digital signal conversion means coupled to said readout portions of said solid-state imagers for producing digital signals representative of said analog image-representative signals; and

clock signal generator means for supplying a plurality of mutually out-of-phase clock signals to said readout portions of respective ones of said plurality of solid-state imagers for causing said readout portions to supply said analog image-representative signals at a first repetition rate in a time sequential manner, and for causing said analog-to-digital signal conversion means to operate at a second repetition rate equal to N times said first repetition rate for sequentially providing digital signals which are representative of different color components of said same portion of said incident light image.

4,599,641

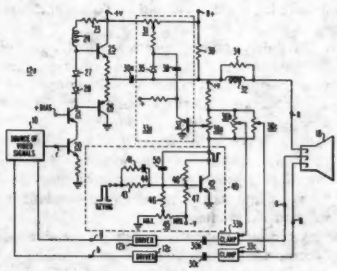
BRIGHTNESS CONTROL APPARATUS FOR A VIDEO SIGNAL PROCESSING SYSTEM

Anthony Troiano, Princeton Junction, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 28, 1984, Ser. No. 675,747

Int. Cl.⁴ H04N *9/20, 5/57*

U.S. Cl. 358—39 **4 Claims**



1. In a video signal processing and display system including

a color image display device having plural intensity control electrodes, and plural video output driver amplifier stages for respectively providing video output signals to said intensity control electrodes, apparatus comprising:

plural means for respectively AC coupling video output signals from said driver stages to said intensity control electrodes of said image display device;

plural switching means, each having a control input, respectively coupled to said AC coupling means for forming plural video signal clamps therewith;

amplifier means with an input and an output;

adjustable brightness control means coupled to said amplified means;

source of keying pulses, occurring during video signal clamping intervals, coupled to said amplifier means for enabling said amplifier means to produce brightness determinative output pulses with amplitudes in accordance with a setting of said brightness control means; and

plural adjustable means coupled in common to said output of said amplifier means and coupled separately to said control inputs of said switching means for conveying to said control inputs amplitude adjusted versions of said brightness determinative output pulses.

4,599,642

VIDEO SIGNAL PROCESSOR WITH BIAS ERROR COMPENSATION

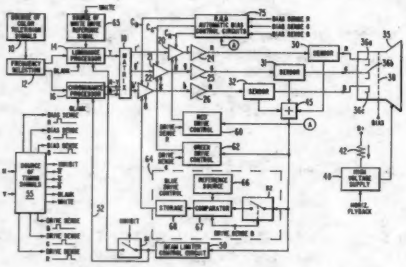
Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 2, 1984, Ser. No. 535,390

The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.

Int. Cl.[4] H04N *9/20, 5/68, 9/16, 9/535*

U.S. Cl. 358—65 **7 Claims**



1. In a system including a video channel comprising luminance and chrominance channels for processing a video signal containing image intervals and image blanking intervals, and a current conductive image display device responsive to video signals coupled thereto via said video channel; apparatus comprising:

automatic drive control means coupled to said video channel for monitoring the conduction of said image display device during prescribed drive control intervals within image blanking intervals, to maintain a desired drive characteristic for said video channel;

automatic bias control means coupled to said video channel for monitoring the conduction of said image display device during prescribed bias control intervals within image blanking intervals, to maintain a desired bias characteristic for said video channel;

means for automatically limiting excessive beam currents conducted by said image display device in response to video signal image information, said limiting means providing an output beam current limiting control signal;

switching means for selectively coupling said control signal to said luminance channel during intervals including said image intervals; and

means for coupling said control signal to said chrominance channel during said image intervals and during said bias control intervals independent of the operation of said switching means.

4,599,643

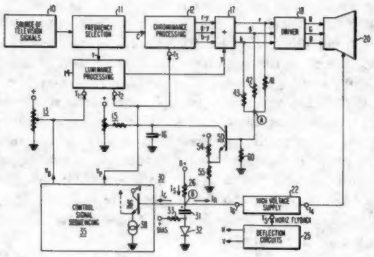
APPARATUS RESPONSIVE TO PLURAL COLOR VIDEO SIGNALS FOR AMPLITUDE LIMITING THE VIDEO SIGNALS TO ASSIST BEAM CURRENT LIMITING

Wayne E. Harlan, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 29, 1983, Ser. No. 566,904

Int. Cl.[4] H04N *9/20, 9/16*

U.S. Cl. 358—74 **2 Claims**



1. In a system for processing and displaying color video signal image information, apparatus comprising:

a source of plural color video signals;

a current-conducting color image display device;

a supply network including a source of high voltage coupled to said image display device for providing a high operating voltage and resupply current to said image display device;

a display device beam current limiter network coupled to said supply network and to said source of video signals, said beam current limiter network being responsive to the magnitude of resupply current representative of beam currents conducted by said image display device for providing a first control signal representative of the magnitude of said representative resupply current above a threshold level;

means for coupling said first control signal to said signal source for limiting the magnitudes of said plural color signals from said source in accordance with the magnitude of said first control signal;

plural color signal output paths associated with respective outputs of said source of plural color signals;

a video output signal display driver stage for providing plural amplified color signals suitable for driving signal inputs of said display device in response to plural color signals received as inputs from said plural signal output paths;

combining means for providing a combined signal representative of the sum of the instantaneous magnitudes of said plural color signals from said source;

means for comparing said combined signal with a substantially fixed threshold reference level to provide an ouput signal representative of said combined signal when said combined signal exceeds said threshold level in a white image direction;

means for detecting said representative output signal to provide a second control signal; and

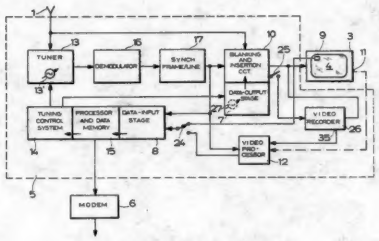
means for coupling said second control signal to said signal source for limiting the magnitudes of said plural color signals from said source in accordance with the magnitude of said second control signal.

4,599,644

METHOD OF AND APPARATUS FOR MONITORING VIDEO-CHANNEL RECEPTION

Peter Fischer, Dolderstr. 40, 8032 Zürich, Switzerland

Continuation-in-part of Ser. No. 614,414, May 25, 1984, abandoned. This application Oct. 25, 1984, Ser. No. 664,684
Claims priority, application Fed. Rep. of Germany, May 25, 1983, 3318919
Int. Cl.[4] H04N 17/04, 7/08, 17/06
U.S. Cl. 358—84 13 Claims



1. A method of monitoring video-channel reception at a location served by a plurality of transmitting stations, sending out video signals modulated on carrier frequencies representing different channels, and equipped with a television receiver to which incoming video signals are fed and which is tuned to reproduce the video signals of a selected channel as a picture displayed on a viewing screen of the receiver comprising the steps of:

(a) blanking a visually insignificant area of a picture which is to be displayed on said viewing screen;

(b) injecting data relevant to the viewing of said picture in the blanked area thereof;

(c) sensing the data appearing in said blanked area during step (b); and

(d) processing the data sensed in step (c) to determine the selected channel, wherein steps (a) through (d) are performed at said location during the viewing of a picture displayed on said screen.

7. In a telecommunication system wherein a television receiver at a location served by a plurality of transmitting stations, sending out video signals modulated on carrier frequencies representing different channels, is tunable to reproduce the video signals of a selected channel as a picture displayed on a viewing screen,

the combination therewith of an apparatus interposed between a source of incoming carrier frequencies and a signal input of said receiver, said apparatus comprising pick-up means coupled with said receiver, synchronizing means operatively connected to said source for generating line-synchronizing and frame-synchronizing signals enabling said pick-up means to detect monitoring data replacing said video signals during a small fraction of a recurring frame cycle of a selected channel

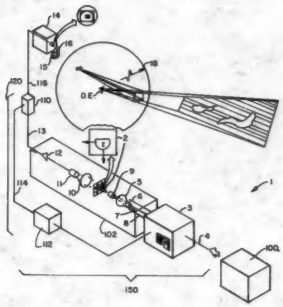
corresponding to a visually insignificant area of the picture, processing means connected to said pick-up means for accumulating the detected monitoring data and delivering same to an associated peripheral unit, and blanking means controlled by said synchronizing means and by said source for suppressing incoming video signals during a scan of said area and inserting said monitoring data into said area, wherein said processing means preferably includes a memory storing some or all of said monitoring data in a digitized form.

4,599,645

SYSTEM FOR IMAGE GENERATION

Raymond E. Brown; Homer E. Dillard, both of St. Louis County; James W. Green, St. Charles County, and Stuart A. McIntosh, St Louis County, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Mar. 1, 1983, Ser. No. 471,007
Int. Cl.[4] H04N 7/18, 7/00
U.S. Cl. 358—104 17 Claims



1. A system for generating an image to be projected on a curved projection surface area, comprising:

raster generating means for developing control voltages for a cathode ray tube, including means for achieveing a geometric transform of images from a flat transparency to said curved projection area, said raster generating means including combining means having a plurality of inputs and an output operatively connected to a plurality of multiplying digital-to-analog converters; a first sweep generator operatively connected to said combining means at one of said inputs and to at least one multiplying digital-to-analog converters; a second sweep generator operatively connected to said combining means along one of said inputs and to at least one of said multiplying digital-to-analog converters; a plurality of multiplying digital-to-analog converters operatively connected to said first sweep generator and to said second sweep generator; means on the output side of said multiplying digital-to-analog converters for generating control voltages to a cathode ray tube based on a position with respect to said image of an observer of said image;

flying spot scanner means including said cathode ray tube operatively connected to said raster generator means, a transparency aligned with said cathode ray tube, and means for superimposing the cathode ray tube image over said transparency for providing a first video signal, said transparency being a representation of a real world scene and being removably mounted in said flying spot scanner means to permit easy change of the projected scene;

special effects generating means operatively connected to said raster generating means for providing a second video signal, said special effects generating means comprising means for generating a video signal for presenting a haze band at the earth/sky interface of said projected scene;

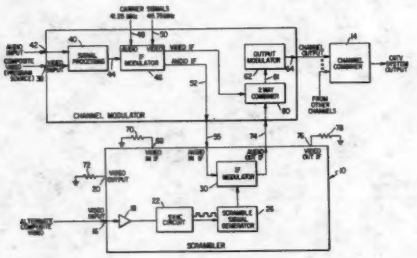
means for combining the first and second video signals; and

means for projecting said combined video signal on said projection area.

4,599,646
METHOD AND APPARATUS FOR IDENTIFYING UNAUTHORIZED OR DEFECTIVE CONVERTER/DECODER BOXES IN CATV SYSTEM

Johnny L. Cottam, Plano, Tex., assignor to D-Tec Industries, Inc., Plano, Tex.

Filed May 18, 1984, Ser. No. 611,756
Int. Cl.[4] H04N 7/167
U.S. Cl. 358—121 **11 Claims**



1. A head-end apparatus for a CATV system for identifying unauthorized or defective converter/decoder boxes, comprising:

channel means for receiving a first program source and generating IF audio and video signals, said first program source having a synchronization rate;

scrambler means having an input connected to said channel means for receiving said IF audio signal and generating a scrambled IF audio signal having a scramble signal component, said scrambler means having a synchronization rate set by a second program source input thereto, said second program source having a synchronization rate different from said synchronization rate of said first program source; and

combiner means connected to said channel means and said scrambler means for receiving said IF video signal and said scrambled audio signal, respectively, and generating a composite signal;

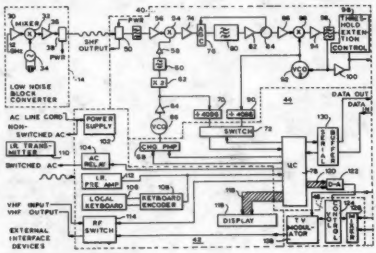
said channel means connected to said combiner means for receiving said composite signal and generating a CATV channel output signal, whereby an unauthorized or defective converter/decoder box applies said scramble signal component of said scrambled IF audio signal to said IF video signal to scramble a non-premium channel of the CATV system.

4,599,647
RECEIVER WITH INTERFACE FOR INTERACTION WITH CONTROLLER-DECODER

Asbok K. George, Toronto, and John Jeffers, Downsview, both of Canada, assignors to General Instrument Corporation, New York, N.Y.

Filed Nov. 3, 1983, Ser. No. 548,357
Int. Cl.[4] H04N 7/167, 7/16, 1/34; H04K 1/00
U.S. Cl. 358—122 **37 Claims**

1. A receiver for use with a detachable addressable controller-decoder adapted to decode broadcast signals and a television to form one of a plurality of remote terminals in a system for distributing encoded broadcast signals, the receiver comprising means for generating control signal, tuning means for selecting one of the broadcast signals, said tuning means having an output, broadcast signal output means adapted to be connected to the decoder, said broadcast signal output means being operably connected to said tuning means output for transfer of said selected signal to the decoder, means for displaying indicia, control means operably connected to said control signal generating means for receiving said control signals and to said tuning means and said display means for ascertaining the status thereof and for controlling the operation therein in accordance with said control signals, means for generating data signals for transfer to the decoder, said data signals comprising data representative of said control signals and data representative of the status of said tuning means and said display means, means for receiving responsive data signals transferred from the decoder, said responsive data signals comprising data representative of signals generated by the decoder, said control means controlling the operation of said

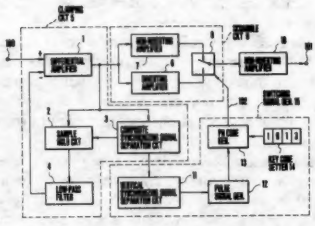


tuning means and said display means in accordance with said decoder generated signals, upon receipt thereof, means for operably connecting the receiver and the decoder for transfer of said generated data signals from said control means to the decoder and receipt of said responsive data signals by said control means form the decoder, broadcast signal input means adapted to be connected to the decoder to receive the selected signal therefrom and means, operably connected to said broadcast signal input means for modulating the selected signal for display on the television.

4,599,648
VIDEO SIGNAL TRANSMISSION SYSTEMS

Akira Fujii; Tadatsugu Tokunaga, and Hiroaki Adachi, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 22, 1984, Ser. No. 612,835
Claims priority, application Japan, May 24, 1983, 58-90939; May 24, 1983, 58-90940
Int. Cl.[4] H04N 7/167
U.S. Cl. 358—124 **4 Claims**



1. A video signal transmission system comprising, in combination, a video processing unit on a transmission side adapted to convert the waveform of an original television video signal, for transmission thereof and a restoring processing unit on the receiving side adapted to restore a waveform converted television video signal, for reproduction of the original signal, said video processing unit including:

means responsive to a pseudo-random code utilizing a horizontal scanning frequency as a clock pulse, for partly polarity inverting a composite video signal containing a horizontal synchronizing signal such that the white level of an inverted video signal portion will not fall below a peak level of a non-inverted horizontal sychronizing signal portion; and

means for transmitting said partly polarity inverted composite video signal;

said restoring processing unit including:

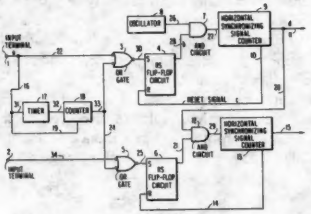
means responsive to said pseudo-random code, for inverting again the polarity of said polarity inverted composite video signal portion to obtain a restored composite video signal portion having the same polarity as the original composite video signal; and

clamp means for detecting a difference between the peak level of the horizontal synchronizing signal of said inverted and restored composite video signal portion and the peak level of the horizontal synchronizing signal of said non-inverted composite video signal portion and feedbacking the detected difference to the input of said clamp means so as to control these peak levels to the same level.

4,599,649
SYNCHRONOUS CIRCUIT

Tetsuro Funai, Osaka, Japan, assignor to Funai Electric Company Limited, Daito, Japan

Filed Mar. 6, 1984, Ser. No. 586,693
Claims priority, application Japan, Nov. 4, 1983, 58-207730
Int. Cl.⁴ H04N *5/04*
U.S. Cl. 358—148 **1 Claim**



1. A synchronous circuit used to coincide an external video signal from a laser disc, for example, with a video signal generated by an internal computer characterized in that an input terminal 1 for an external horizontal synchronizing signal is connected to the S terminal of a R-S flip-flop circuit 4, an output stage of said R-S flip-flop circuit 4 is connected to one input terminal at an AND circuit 7, an oscillator 8 is connected to the other input terminal at said AND circuit 7, a horizontal synchronizing signal counter 9 is connected to the output stage of said AND circuit 7, and output stage of said counter 9 is connected to the R terminal at said R-S flip-flop circuit 4 through a reset line 10 and to an internal horizontal synchronizing signal line 11, and a cycle period of said counter 9 is set somewhat smaller than that of said external horizontal synchronizing signal.

4,599,650
TELEVISION FRAME SIGNAL SYNCHRONIZING CIRCUITS

James H. Wilkinson, Basingstoke, United Kingdom, assignor to Sony Corporation, Tokyo, Japan

Filed May 7, 1984, Ser. No. 607,765
Claims priority, application United Kingdom, May 18, 1983, 8313780
Int. Cl.⁴ H04N *5/04*
U.S. Cl. 358—148 **6 Claims**

1. A television frame signal synchronizing circuit comprising:

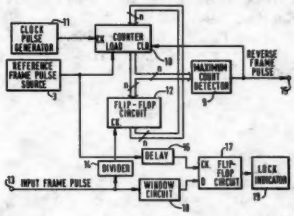
a presettable cyclic counter;

a clock pulse generator for supplying clock pulses to said counter;

a store for storing the count of said counter;

a source of reference television frame pulses with which input television frame pulses are to be synchronized, each of said reference frame pulses causing the count stored in said store to be loaded into said counter; and

a television signal processor capable of adjusting, in dependence on a reverse television frame pulse, the timing of a television signal passed therethrough, carry signals from said counter forming said reverse television frame pulses for supply to said television signal processor which there-

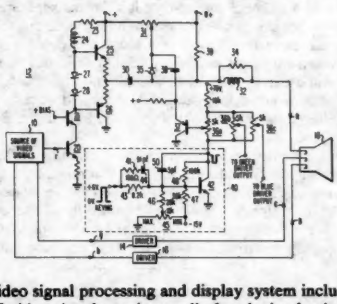


upon adjusts the timing of said television signal passed therethrough, said television signal including said input television frame pulses, and at least some of said input frame pulses being derived and supplied to said store which thereupon stores the count of said counter; the arrangement being such that the timing of said television signal is adjusted to bring said input frame pulses into synchronism with said reference frame pulses.

4,599,651
PULSE AMPLIFIER IN A BRIGHTNESS CONTROL SYSTEM

William E. Rodda, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 28, 1984, Ser. No. 675,780
Int. Cl.⁴ H04N *5/57, 9/20*
U.S. Cl. 358—168 **8 Claims**



1. In a video signal processing and display system including a source of video signals, an image display device having an intensity control electrode, and a video signal channel for conveying video signals to said intensity control electrode, image brightness control apparatus comprising:

a keyed video signal clamp coupled to said video channel, said clamp having a control input;

an amplifier with an input, and an output coupled to said control input of said clamp;

a source of keying pulses occurring during periodic video signal clamping intervals;

an adjustable brightness control coupled to said input of said amplifier;

an input circuit including a first capacitance and a resistance for conveying said keying pulses to said input of said amplifier, said keying pulses enabling said amplifier to produce output pulses with amplitudes in accordance with a setting of said brightness control; and

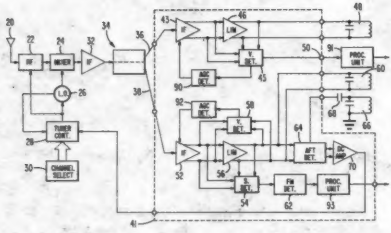
a second capacitance coupled between said input and output of said amplifier.

4,599,652

DUAL CHANNEL IF TV RECEIVER WITH AFT DERIVED FROM THE PICTURE CARRIER IN THE SOUND CHANNEL

David J. Carlson, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 17, 1984, Ser. No. 581,127
Int. Cl.[4] H04N *5/50;* **H04B** *11/16*
U.S. Cl. 358—195.1 **7 Claims**



1. Apparatus comprising:

a mixer having a first input for receiving RF television signals, a second input for receiving a local oscillator signal, and an output for providing an IF signal including a video and a sound carrier;

local oscillator means for generating said local oscillator signal and controlling its frequency in response to a control signal applied to a frequency control input;

a video channel including vestigal sideband filter means coupled to the output of said mixer for providing a first filtered version of said video carrier of said IF signal, and video detector means responsive to said first filtered video carrier for providing a baseband video signal;

an audio channel including filter means separate from said vestigal sideband filter means and coupled to the output of said mixer for providing a second filtered version of said video carrier of said IF signal and a filtered version of said sound carrier of said IF signal, and audio detector means responsive to said second filtered video carrier and said filtered sound carrier for providing a baseband audio signal; and

AFT means coupled to said audio channel for deriving an automatic fine tuning (AFT) signal representing the deviation of the frequency of said video carrier of said IF signal from its nominal value in response to said second filtered video signal, said AFT signal being applied to said frequency control input of said local oscillator means.

4,599,653

FOCUS INDICATOR APPARATUS FOR AN ELECTRONIC CAMERA

Kenji Kimura, and Masatoshi Ida, both of Tokyo, Japan, assignors to Olympus Optical Co. Ltd., Tokyo, Japan

Filed Sep. 6, 1983, Ser. No. 529,612
Claims priority, application Japan, Sep. 16, 1982, 57-159437
Int. Cl.[4] H04N *5/30*
U.S. Cl. 358—224 **12 Claims**

3. A focus indicator apparatus for an electronic camera, comprising:

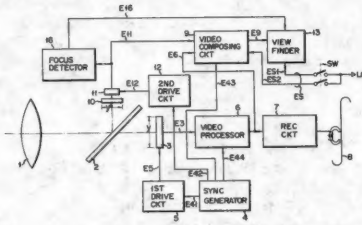
first video means for converting an object image to a first video signal;

second video means for converting part of said object image to a split image and, thereafter, for converting the split image to a second video signal;

composing means coupled to said first and said second video means, for combining said second video signal with part of said first video signal and providing a composite video signal; and

display means coupled to said composing means, for displaying the image corresponding to said composite video signal, the split image derived from said object image on the basis of said second video signal being adapted to function as a focus indicator;

wherein said first video means includes first means for generating a color video signal, including color information on



said object image, in accordance with a first sync signal, and second means coupled to said first means for composing said first video signal, including the color information from said color video signal, in accordance with a composite sync signal; and

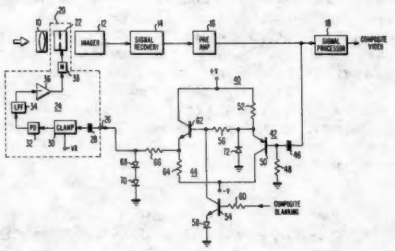
wherein said second video signal is constituted by a monochrome signal, so that an image displayed on said display means has said split image as a monochrome image and a remaining image portion as a color image.

4,599,654

DARK CURRENT ELIMINATOR USEFUL FOR AUTO-IRIS CONTROLLER

Thomas D. Monroe, Lititz, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 31, 1984, Ser. No. 666,781
Int. Cl.[4] H04N *5/238, 5/228*
U.S. Cl. 358—228 **11 Claims**



1. A video camera comprising:

a lens for imaging a scene;

image transducing means including an imager for supplying a video signal having recurrent blanking intervals interspersed with active picture intervals having a range of amplitude variations representative of bright and dark portions, respectively, of said imaged scene;

an iris located between said lens and said imager for controlling the amount of light imaged onto said imager;

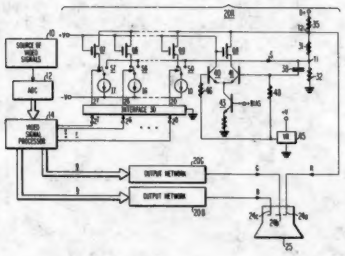
iris control means, responsive to a peak level of said video signal for controlling the iris in a degenerative feedback manner so as to control the light imaged onto said imager; and

video signal modifying means coupled to be responsive to the video signal for modifying the video signal applied to said iris control means, said modifying means including means for setting the level of said blanking portions of said video signal to a given level, said given level being a level within the range of amplitude variations of the active picture interval of the video signal applied to said modifying means.

4,599,655
KINESCOPE DRIVER WITH HIGH FREQUENCY COMPENSATION

Werner Hinn, Zollikerberg, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 27, 1984, Ser. No. 544,453
Int. Cl.[4] H04N *5/68, 9/535*
U.S. Cl. 358—242 **14 Claims**



1. A video signal processing system comprising:

a source of a video signal including high frequency components and relatively lower frequency components;

image display means for producing an image display in response to a video signal applied to an intensity control electrode thereof;

video output means including driver means responsive to said video signal from said source for producing a video output signal with a magnitude sufficient for directly driving said intensity control electrode of said display means, said video output signal being subject to exhibiting attenuated high frequency components;

means for coupling said video output signal to said intensity control electrode;

means for developing a first video signal related to said video output signal but having a relatively unattenuated high frequency characteristic compared to said video output signal;

means for deriving a second video signal from said video output signal;

means for combining said second video signal with said first video signal in a given mutual amplitude and phase relationship for producing a resultant high frequency signal representative of high frequency components attenuated in said video output signal; and

means for coupling said resultant signal to said video output means.

4,599,656
PROCESSING OF GRAY SCALE IMAGE PELS TO FACILITATE DATA COMPRESSION

Joan M. Bellinghausen, Chapel Hill, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

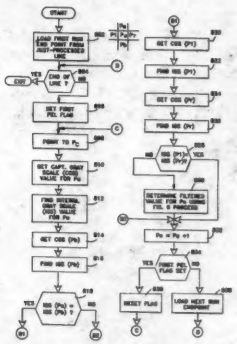
Filed Feb. 21, 1984, Ser. No. 581,768
Int. Cl.[4] H04N *1/40, 1/419*
U.S. Cl. 358—261 **5 Claims**

1. For use in an image processing system of the type wherein capture gray scale pel values are to be thresholded to binary values to facilitate subsequent data compression, a method for identifying a pel which may require filtering to reduce distortion due to sampling along image vertical edges, said method comprising the steps of:

retrieving capture gray scale pel values for a current pel and for both pels which are vertical neighbors of the current pel;

assigning each vertical neighbor pel one of a limited number of gray scale range values as a function of the capture gray scale value of the pel;

identifying, as a filtering candidate, any current pel having vertical neighbors with the same assigned value;



retrieving capture gray scale pel values for both pels which are horizontal neighbors of each candidate current pel;

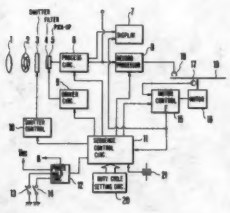
assigning each horizontal neighbor pel one of a limited number of gray scale range values as a function of the capture gray scale value of the pel; and

finally selecting, for filtering, each candidate current pel having horizontal neighbors with different assigned values.

4,599,657
IMAGE PICK-UP DEVICE

Toshio Kaji, Kanagawa, and Nobuyoshi Tanaka, Kanagawa, Takao Kinoshita, Tokyo; Akihiko Tojo, Kanagawa; Tsutomu Takayama, Kanagawa; all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1982, Ser. No. 452,500
Claims priority, application Japan, Dec. 29, 1981, 56-215333; Dec. 29, 1981, 56-215337; Dec. 29, 1981, 56-215342; Dec. 29, 1981, 56-215343; Dec. 29, 1981, 56-215344; Dec. 29, 1981, 56-215345
Int. Cl.[4] H04N *5/76, 5/30*
U.S. Cl. 358—335 **13 Claims**



1. An image pick-up device comprising:

(a) solid-stage image pick-up means, having a light sensing portion for producing electrical information corresponding to optical information and a storage portion for storing

the electrical information produced by the light sensing portion;

(b) control means for controlling the transfer of the electrical information from the sensing portion to the storage portion in the solid-state image pick-up means; and

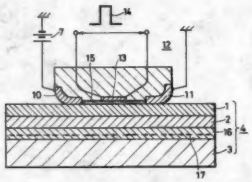
(c) light shading means for shading the light sensing portion during transfer of the electrical information in the light sensing portion of the solid-state image pick-up means to the storage portion.

4,599,658

THERMO-MAGNETIC RECORDING METHOD

Koichi Saitoh; Teruhiko Itami; Toshifumi Kimoto, and Nobuo Nishimura, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1982, Ser. No. 411,129
Claims priority, application Japan, Aug. 25, 1981, 56-132893
Int. Cl.³ G11B 5/02
U.S. Cl. 360—59 **10 Claims**



1. A thermo-magnetic recording method, comprising:

providing a magnetic recording medium having a thermally magnetizable ferromagnetic surface layer disposed on an insulating layer;

contacting a pair of spaced apart electrodes to said ferromagnetic surface layer in a spaced manner said electrodes traversing said ferromagnetic surface layer and defining a predetermined portion of said ferromagnetic surface layer;

applying a voltage to said electrodes causing Joule preheating of said ferromagnetic surface layer; and

inputting a heat pattern in the form of an image and applying uniform magnetic field to form a magnetic latent image in said ferromagnetic surface layer;

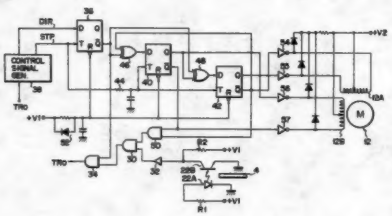
wherein said uniform magnetic field is applied by means of a magnetized layer of said magnetic recording medium.

4,599,659

FLOPPY DISK DRIVE APPARATUS

Shunji Saito, Numazu, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed May 4, 1984, Ser. No. 607,256
Claims priority, application Japan, May 13, 1983, 58-83852
Int. Cl.⁴ G11B 5/54
U.S. Cl. 360—75 **10 Claims**



1. A floppy disk drive apparatus comprising:

a magnetic head section attached on a carrier;

a control signal generating circuit for generating a step signal and a direction instruction signal;

first drive means for rotating a floppy disk;

second drive means for driving said magnetic head section in the radial direction of said floppy disk in response to the step signal and the direction instruction signal from said control signal generating circuit; and

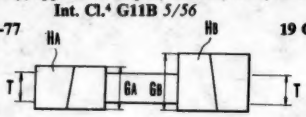
detecting means for generating an output signal when it detects that said magnetic head section locates in the outer limit location of said floppy disk, said detecting means being inhibited from generating an output signal in response to the direction instruction signal generated for driving said magnetic head section in an inner direction of said floppy disk.

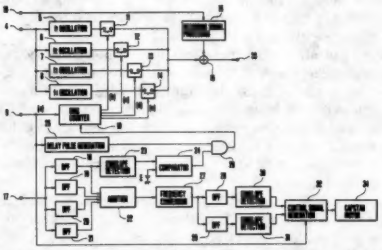
4,599,660

VIDEO SIGNAL REPRODUCING APPARATUS

Susumu Kozuki, Tokyo; Hiroyuki Takimoto, Kanagawa; Hiroo Edakubo, Tokyo, and Nobutoshi Takayama, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1984, Ser. No. 573,368
Claims priority, application Japan, Jan. 27, 1983, 58-12256
Int. Cl.⁴ G11B 5/56
U.S. Cl. 360—77 **19 Claims**





1. A video signal reproducing apparatus for reproducing a video signal from many recording tracks formed on a recording medium with even spacing, said apparatus comprising:

(a) a first rotating head;

(b) a second rotating head which has a larger head width than the first rotating head and is arranged to trace the recording tracks one after another alternately with the first rotating head;

(c) detecting means for detecting the positional errors of the first and second rotating heads relative to one of the recording tracks by using the outputs of the first and second rotating heads;

(d) adjusting means for adjusting the output of said detecting means related to the second rotating head on the basis of difference in head width between the first and second rotating heads;

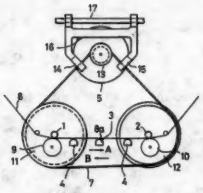
(e) recording medium moving means for moving the recording medium in the direction intersecting the recording tracks; and

(f) control means for controlling the moving means on the basis of the output of said detecting means adjusted by said adjusting means.

4,599,661
MECHANISM FOR DRIVING CAPSTANS IN TAPE RECORDERS

Hiroshi Muramatsu, Gunma, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Jan. 6, 1983, Ser. No. 456,325
Claims priority, application Japan, Jan. 12, 1982, 57-2317[U]
Int. Cl.[4] G11B *15/00*
U.S. Cl. 360—96.2 **5 Claims**



1. A capstan driving mechanism for use in a tape recorder, comprising:

a pair of capstans each having first and second flywheels, each flywheel including smaller- and larger-diameter portions coaxially spaced from each other;

a capstan motor having a pulley including a pair of first and second pulley portions coaxially spaced from each other, said capstan motor being rotatable selectively in opposite directions;

an endless belt looped around said pulley and said first and second flywheels in driving relation thereto;

a pair of idlers for pressing a magnetic tape against said capstans, respectively, to cause the magnetic tape to travel, said magnetic tape being drivable selectively in a first direction from said first to second flywheels and a second direction from said second to first flywheels in response to energization of said motor; and

arm means loosely gripping said endless belt therein for shifting said endless belt between a first position in which said endless belt is looped around said larger-diameter portion of said first flywheel, said smaller-diameter portion of said second flywheel, and said first pulley portion when the magnetic tape runs in said first direction, and a second position in which said endless belt is looped around said smaller-diameter portion of said first flywheel, said larger-diameter portion of said second flywheel, and said second pulley portion when the magnetic tape runs in said second direction, whereby said capstans rotate at different speeds to tension a portion of the magnetic tape which extends between said capstans.

4,599,662
MECHANISM FOR DRIVING A TAPE RECORDER

Tadahisa Iwasaki, Saitama, Japan, assignor to Pioneer Ansafone Manufacturing, Saitama, Japan

Filed Nov. 1, 1982, Ser. No. 438,233
Claims priority, application Japan, Nov. 2, 1981, 56-175899
Int. Cl.[4] G11B *15/24, 15/32*
U.S. Cl. 360—96.4 **3 Claims**

1. A mechanism for driving a tape recorder, comprising takeup and supply reels (**24**, **25**) having takeup and supply reel gears (**24*b***, **25*a***), respectively;

a pair of intermeshing gears (**21**, **20**) rotatably disposed between said takeup and supply reel gears, and selectively engageable with said takeup and supply reel gears;

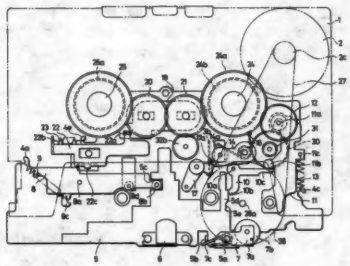
a selection lever (**19**) supporting said intermeshing gears and selectively movable between a first position in which one of said intermeshing gears (**21**) is in mesh with said takeup gear (**24*b***), a second position in which the other of said intermeshing gears (**20**) is in mesh with said supply reel gear (**25*a***), and a third position in which said intermeshing gears are held out of mesh with said takeup and supply reel gears;

a rotatable cam plate (**34**) having a series of cam faces for providing different modes of operation of the tape recorder;

a swing arm (**39**) angularly movable by said rotatable cam plate in response to rotation thereof for moving said selection lever (**19**);

a drive source (**2**) having an output gear (**29**);

a pair of gear units (**15*a***, **15*b***, **32*a***, **32*b***) meshing with each other, one of said gear units being engaged with one of



said intermeshing gears (**21**) at all times and the other gear unit being engageable with said output gear (**29**) to rotate said pair of intermeshing gears;

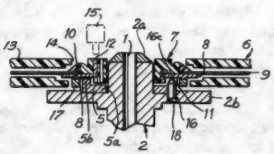
a joint arm (**14**) supporting said other gear unit, and movable to render the latter to be engaged with and disengaged from said output gear; and

a control arm (**17**) angularly movable in response to selection of one of said different modes of operation for actuating said joint arm to displace said other gear unit out of mesh with said output gear while said cam plate is rotating to keep said pair of intermeshing gears from rotating.

4,599,663
RECORDING APPARATUS WITH STABLE DISC SUPPORT AND HIGH MAGNETIC FLUX HOLD-DOWN

Etsuro Saito, Ayase; Shinichiro Takahashi, Tokyo; Masami Yuasa, Chofu, and Tsutomu Akiyama, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 3, 1983, Ser. No. 537,989
Claims priority, application Japan, Oct. 29, 1982, 57-164078[U]
Int. Cl.[4] G11B *5/012, 23/00*
U.S. Cl. 360—97 **7 Claims**



1. A magnetic recording apparatus comprising:

rotary disc means rotatable about an axis;

magnet means positioned on said rotary disc means; and

at least three pins mounted on said rotary disc means for rotation therewith and positioned about a circle concentric with said axis for supporting an information record disc thereon, each of said at least three pins projecting from said rotary disc means to substantially the same height relative thereto; and

said magnet means having a height lower than said at least three pins relative to said rotary disc means for magnetically attracting an information record disc to secure the latter on said at least three pins so that said at least three pins accurately and exclusively support said information record disc on said rotary disc means.

4,599,664

DISK STORAGE DRIVE

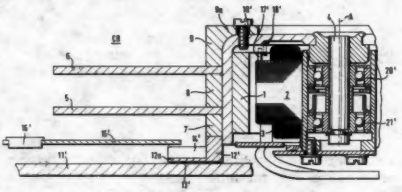
Bernard Schuh, St. Georgen, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co KG, St. Georgen, Fed. Rep. of Germany

Continuation of Ser. No. 353,584, Mar. 1, 1982, Pat. No. 4,438,542, which is a continuation-in-part of Ser. No. 127,404, Mar. 5, 1980, abandoned. This application Feb. 27, 1984, Ser. No. 583,877

The portion of the term of this patent subsequent to Mar. 27, 2001, has been disclaimed.

Int. Cl.[4] G11B *5/012*

U.S. Cl. 360—97 **1 Claim**



1. In a digital information-storage apparatus of the type having a read and/or write head which inscribes information bits onto, and/or reads them from, at least one data storage disk which is rotated at high speed relative to such head by means of a rotary disk-holding structure configured to be accommodated in the large central aperture of such disk and transmit rotation thereto,

the combination with said rotary disk-holding structure of a brushless d.c. reluctance-torque motor, said brushless d.c. reluctance-torque motor comprising

a stator,

a rotor,

said rotor being coupled to said rotary disk-holding structure to transmit rotation thereto,

said rotor being a permanent-magnet rotor,

said stator having a stator winding which when energized by d.c. current establishes a stator field which in cooperation with said rotor produces an electromagnetic-torque component having a magnitude which is a variable function of rotor angular position and which, at predetermined angular positions of said rotor, is of zero magnitude, and thus incapable of starting the rotor from said predetermined positions,

whereby if, when the motor is shut off, the rotor were to come to a complete stop in said predetermined positions, it could not thereafter be restarted by mere application of current to the stator winding,

said rotor and stator being separated from each other by an air gap and together forming a magnetic circuit whose reluctance is a function of the angular position of said rotor thereby producing a reluctance-torque component, the reluctance-torque component varying as a function of rotor angular position and having a magnitude which is of non-zero value at said predetermined rotor angular positions at which the electromagnetic-torque component is of zero value,

said non-zero value of said reluctance-torque component at said predetermined angular positions precluding the rotor from becoming stuck at said predetermined positions during start-up of the motor, and thereby avoiding the need for a separate start-up component,

an angular position detector detecting the angular position of said rotor,

and means controlling flow of current through said stator winding in dependence upon the operation of said angular position detector to cause said stator field to alternate, in dependence upon rotor angular position, between two stator-field states.

4,599,665

LOCKING DEVICE FOR RECORDER OPERATION MODES

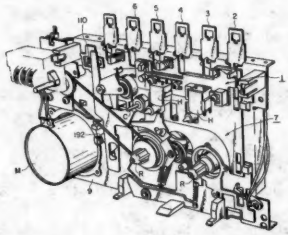
Kobun Yoshida, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 413,843, Sep. 1, 1982, abandoned. This application Apr. 24, 1985, Ser. No. 732,881

Claims priority, application Japan, Sep. 2, 1981, 56-1304851[U]; Sep. 2, 1981, 56-1304901[U]

Int. Cl.[4] G11B *5/54, 21/22*

U.S. Cl. 360—105 **5 Claims**



1. In a tape recorder of the type having a stop mode and a plurality of transport modes and generally comprising a chassis, a first lock plate slidable along said chassis and biased from an unlocking side to a locking side, a plurality of transport mode operating rods, a stop mode operating rod, and a tape cassette pocket having a normally locked door and a door lock, the improvement:

wherein each of said transport and stop mode operating rods has an inclined cam face having an upper and lower end, said transport and stop mode operating rods being movable in a vertical linear direction relative to said upper and lower end, and in a direction normal to the sliding direction of said first lock plate; and

wherein each of said transport mode operating rods has an engaging step formed at the upper end of said inclined cam face;

said first lock plate including: transport mode engaging projections at positions corresponding to the lower ends of the inclined cam faces of said transport mode operating rods, and a stop mode engaging projection positioned to engage the cam face of said stop mode operating rod; said transport mode engaging projections on said first lock plate being resiliently biased toward the inclined cam faces such that the depression of a transport mode operating rod produces a camming action between a corresponding cam face and transport mode engaging projection to cause a sliding movement of said first lock plate against its bias, said engaging projection being locked into said engaging step by said bias when said transport mode operating rod is fully depressed, said bias causing said first lock plate to slide to the unlocking side, releasing said transport mode operating rod and stopping the tape recorder, when said engaging projection is unlocked from said engaging step by a camming action of said stop mode operating rod cam face and said stop mode engaging projection before said stop mode operating rod is fully depressed in a stopping position; and comprising:

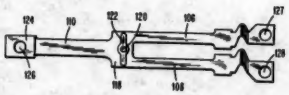
a door lock plate slidable along said chassis, said stop mode operating rod being located at a position confronting a portion of said door lock plate when said stop mode operating rod is fully depressed in the stopping position, such that full depression of said stop mode operating rod engages said door lock plate and causes it to slide in a direction to unlock said door after the tape recorder has stopped.

4,599,666

DISK DRIVE SYSTEM APPARATUS BAND ACTUATOR

Jeffrey Liu, 575 E. Middlefield Rd., Mountain View, Calif. 94043, and Chun H. Tong, 1611 Garvey Pl., San Jose, Calif. 95132

Filed Mar. 7, 1983, Ser. No. 472,542
Int. Cl.[4] G11B *21/08*
U.S. Cl. 360—106 **1 Claim**



1. In an apparatus for moving a magnetic transducer relative to a rotating disk in a magnetic disk drive system which includes a carriage track, a carriage movable along the track for moving the magnetic transducer relative to the track, a drive mechanism for moving the carriage along the track, including a stepper motor stationary with respect to the track and having a rotatable shaft, the improvement comprising:

flexible band actuator means securable to first and second portions of said carriage which are spaced longitudinally along said track, said band actuator means including first, second, and third band portions extending integrally from a common medial band portion in a general Y configuration, means for securing said common medial portion to the shaft of the stepper motor, with said first, second, and third band portions disposed to be wound and unwound about the shaft as the shaft rotates, said first and second band portions each including spring means for tensioning the respective band portions and for expanding to tolerate misalignment of the shaft, said spring means including a generally U-shaped portion formed in each of said first and second bands, means for joining the distal ends of said first and second band portions to the first portion of the carriage, and means for joining the distal end of said third band portion to the second portion of the carriage.

4,599,667

AUTOMATIC AZIMUTH ANGLE ADJUSTMENT HEAD MOUNTING STRUCTURE

Victor B. van Blerk, San Jose, Calif., assignor to Verbatim Corporation, Sunnyvale, Calif.

Filed Mar. 12, 1984, Ser. No. 588,319
Int. Cl.[4] G11B *5/55*
U.S. Cl. 360—106 **8 Claims**

1. Apparatus for use with a rotatable magnetic storage disk having a recording surface including a plurality of record tracks encircling the center of the disk, said apparatus comprising:

(a) a magnetic record head and a magnetic playback head for respectively recording and retrieving data from such a storage disk;

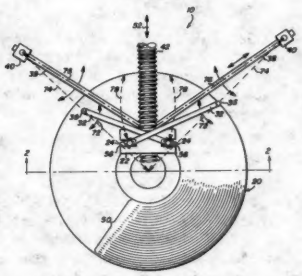
(b) a carriage movably mounted for carrying said record head and said playback head across the recording surface of the storage disk so that said record head and said playback head simultaneously interface with any given record track of such disk for respectively recording data and concomitantly retrieving data from that record track;

(c) drive means, coupled to said carriage, for moving said carriage across the recording surface of such storage disk;

(d) a first supporting mechanism mounting said record head for rotational and translational movement relative to said carriage in a plane substantially parallel to the recording surface of the disk;

(e) a second supporting mechanism mounting said playback head for rotational and translational movement relative to said carriage in a plane substantially parallel to the recording surface of the disk;

(f) positioning means, including first and second positioning arms coupled respectively to said first supporting mechanism and said second supporting mechanism, and arranged to effect respectively, orthogonal movement of said record head and said playback head relative to the direction of movement of said carriage, said first and second positioning arms cooperating with said carriage to cause said record head and said playback head to move simultaneously, in response to movement of said carriage, along respective non-linear operational paths across the storage disk, between a record track remote from the center of the disk and a record track adjacent the center of the disk; and



(g) control means, including first and second control arms coupled respectively to said first supporting mechanism and said second supporting mechanism, to cause said record head and said playback head to rotate, relative to and in response to movement of said carriage, said first and second control arms respectively causing the orientation of said record head and said playback head to vary as they move across the recording surface of the disk, wherein said first and second control arms cause the record head and the playback head to maintain a predetermined azimuth with respect to each record track the record head and the playback head traverse as they move along their respective non-linear paths across the storage disk.

4,599,668

INDUCTIVELY-COUPLED, THIN-FILM M-R HEAD

Neil J. Griffith, San Diego, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 15, 1983, Ser. No. 504,757
Int. Cl.[4] G11B *5/12, 5/30*
U.S. Cl. 360—113 **11 Claims**

1. A magnetic head for reproducing signals recorded in a track on a magnetic recording medium, said head comprising

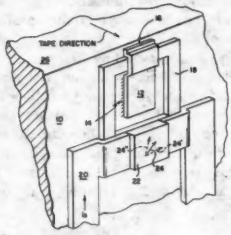
(a) a magnetic substrate,

(b) a core structure magnetically short circuited to said magnetic substrate at a first point thereof, and physically separated from said substrate at a second point thereof, thereby to form a transducer gap for said head at said second point,

(c) an electrically shorted turn of electrically conductive material partially disposed between said core structure and said magnetic substrate, said turn being supported by

said head and so arranged with respect to said core structure and said substrate that changing magnetic flux which traverses said core structure and said substrate induces current in said electrically shorted turn, and

(d) magnetoresistive means disposed remoted from said transducer gap but in such proximity to said shorted turn



that flux induced about said shorted turn couples with said magnetoresistive means, thereby to produce a detectable change in the magnetization of said magnetoresistive means that is substantially immune to thermomechanically caused noise occurring in proximity to said transducer gap.

4,599,669

MAGNETIC-TAPE CASSETTE HAVING AN ELEMENT FOR CLEANING A TAPE DRIVE CAPSTAN DURING NORMAL OPERATION

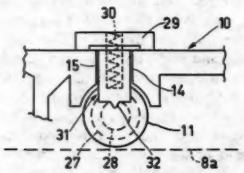
Matheus J. M. Meermans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 29, 1983, Ser. No. 518,496

Claims priority, application Netherlands, May 26, 1983, 8301863

Int. Cl.[4] G11B *23/02, 5/10, 5/127, 5/41*

U.S. Cl. 360—132 **9 Claims**



1. A magnetic-tape cassette comprising:

a housing having two substantially parallel major walls and a front wall, and an opening adjacent said front wall, for passage therethrough of a capstan of a magnetic-tape apparatus, the capstan having a free end and being rotatable about an axis perpendicular to said major walls,

a length of magnetic tape disposed in said housing, arranged to be transportable along and generally parallel to said front wall between the front wall and the capstan so as to be engageable by said capstan, and

a cleaning element, disposed near said front wall, comprising a free end and a cleaning portion which is pointed towards the capstan free end, arranged for engaging said capstan for cleaning the capstan during operation while said tape is engaged by the capstan and is being transported,

characterized in that said housing includes two guide walls between which said cleaning element is guided for movement in a direction substantially perpendicular to the front wall, and

the cassette comprises spring means for urging said cleaning element towards the front wall, said guide walls and spring means being arranged such that during operation the cleaning element presses substantially radially against said capstan.

4,599,670

CONTROL OF RELATIVE HUMIDITY IN MACHINE ENCLOSURES

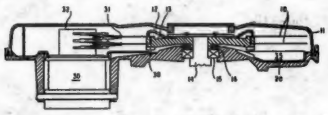
Ivor W. Bolton, Winchester, United Kingdom, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 3, 1980, Ser. No. 126,741

Claims priority, application United Kingdom, Jun. 29, 1979, 7922792

Int. Cl.[4] G11B *0/00*

U.S. Cl. 360—137 **2 Claims**



1. A machine having a substantially sealed enclosure, operation of the machine creating a rise in temperature within the enclosure, the machine comprising:

a rechargeable desiccant within the enclosure for absorbing water vapor therein when said machine is not operating,

a shallow tray for containing the desiccant,

a retaining cover through which air may pass freely for retaining the desiccant in the tray,

two breather orifices communicating between the interior and exterior of the enclosure,

a breather filter associated with both the breather orifices which lie on substantially the same radial line, through which filter air must pass when entering the enclosure via the breather orifices, the filter comprising two chambers both divided by a common filter sheet, each chamber being associated with a respective breather orifice, and

rotating mechanical elements in said enclosure for creating a pressure differential between the breather orifices during machine operation to produce a circulatory exchange of air between the enclosure and its surrounding atmosphere through the breather orifices, said exchange of air driving off moisture from said desiccant after the start of operation of said machine as a result of said temperature rise.

4,599,671

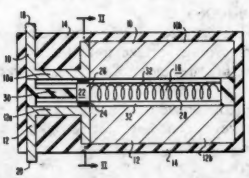
CURRENT LIMITING DEVICES UTILIZING RESISTIVE PARALLEL RAILS

George A. Kemeny, Wilkins Township, Allegheny County, and Russell E. Fox, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 20, 1984, Ser. No. 632,974

Int. Cl.[4] H02H *9/02, 9/08*

U.S. Cl. 361—58 **27 Claims**



1. A current limiting apparatus comprising:

a pair of conductive rails;

a terminal connected to each of said rails for connecting the

current limiting apparatus to an external electrical circuit; and

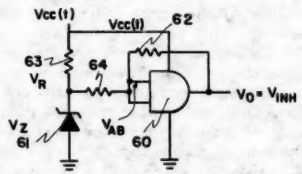
a propellable armature conductor which is connected to conduct current flowing through said current limiting apparatus such that under normal operating conditions, said armature conductor remains substantially stationary and presents a minimal apparatus impedance to said external circuit and such that under fault current conditions, said armature conductor is electromagnetically propelled by the fault current into a resistive portion of said rails thereby adding circuit impedance to limit the fault current magnitude.

4,599,672

FAILSAFE POWER-UP/POWER-DOWN SWITCH

Norman G. Planer, Annandale, Minn., and Zoltan Zansky, Willowdale, Canada, assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 20, 1984, Ser. No. 632,788
Int. Cl.[4] H02H *3/24*
U.S. Cl. 361—92 7 Claims



1. A power-up/power-down logic control switch for use with a logic control circuit comprising:

a source of power supply voltage;

logic circuit means having a power supply input and first and second logic inputs and an output, wherein said power supply input is connected to said source of power supply voltage and said first and second logic inputs are common inputs connected through resistance to a source of logic supply voltage and to said output via a feedback resistor, and wherein said logic circuit means is further characterized by having a minimum input threshold voltage and a maximum input threshold voltage which vary with said power supply input during power-up and power-down of said power supply voltage and function in a manner such that when said source of power supply voltage is turned on, as long as said first and second logic inputs exceed the minimum threshold, the output will be in its maximum value or higher state, and when the value of said first and second logic inputs fall below the minimum input threshold, the output will switch to its minimum value, and when said source of logic supply voltage is turned off, said output of said logic circuit means will switch to its maximum value when said maximum input threshold drops below the voltage of said first and second logic inputs;

a voltage-limiting circuit means connected between ground and said first and second logic inputs thereby limiting the maximum value of said first and second logic inputs; and

wherein the output of said logic circuit means is connected to the inhibit input of a logic control circuit.

4,599,673

DEGAUSSING SYSTEM ARRANGEMENTS

Walter Truskalo, Titusville, and Anthony Troiano, West Windsor Township, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 3, 1984, Ser. No. 677,525
Int. Cl.[4] H01N *9/29*
U.S. Cl. 361—150 5 Claims

1. A degaussing system arrangement comprising:

a degaussing coil associated with a kinescope;

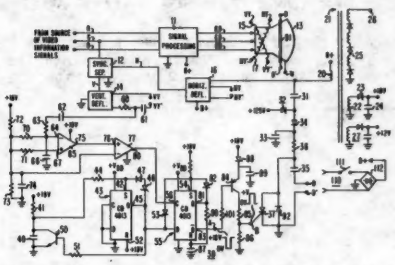
a capacitance coupled to said degaussing coil;

a first source of voltage coupled to charge said capacitance;

switch means operative to couple said degaussing coil and capacitance means in a resonant circuit for effective degaussing of said kinescope;

a second source of voltage;

control means coupled to said second source of voltage and



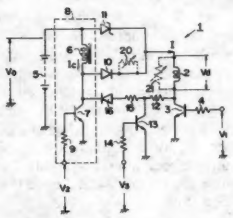
to said switching means for controlling said switching means to effect resonant degaussing action in a first mode of operation when said first and second sources of voltage are energized and for controlling said switching means for discharging said capacitance in a second mode of operation when said first and second sources of voltage are deenergized.

4,599,674

CIRCUIT FOR DRIVING SOLENOID

Masataka Ishikawa, and Masami Kondo, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Japan

Filed Feb. 28, 1985, Ser. No. 706,477
Claims priority, application Japan, Feb. 28, 1984, 59-035342
Int. Cl.[4] H01H *47/32*
U.S. Cl. 361—154 10 Claims



1. A circuit for driving a solenoid, which provides a suddenly standing-up exciting current to the solenoid in order to operate the solenoid at high speed, said circuit comprising:

a d.c. power source for supplying current to the solenoid;

a first switch connected in series with the solenoid for passing or cutting off the exciting current supplied to the solenoid;

a series circuit composed of a choke coil and a second switch which is switched from its ON state to its OFF state when the first switch is switched from its OFF state to its ON state, said series circuit being connected with said d.c. power source, whereby to produce a counterelectromotive force;

a unidirectional element connected between one end of the choke coil and the solenoid in order to apply to the solenoid the counterelectromotive force produced in the choke coil;

a voltage limiting element for limiting the level of the transient voltage applied through the unidirectional element to the solenoid and for applying the voltage of the d.c. power source to said solenoid coil, the voltage limiting element being connected between the solenoid and the d.c. power source;

a circuit means for providing a standby current to the solenoid when the second switch is ON; and

means for providing a maintaining current with a level less than that of the exciting current to the solenoid after the solenoid is energized in response to the operation of said first switch.

4,599,675

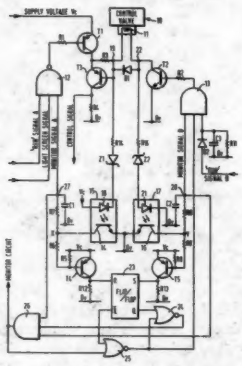
SELF MONITORING SOLID STATE SWITCHING SYSTEM

Kenneth W. J. Fisher, and Michael J. Hare, both of Bristol, England, assignors to P. J. Hare Limited, Avon, England

Filed Jul. 11, 1984, Ser. No. 629,707

Int. Cl.[4] H01H *47/24*

U.S. Cl. 361—173 **13 Claims**



1. A solenoid coil switch circuit comprising two switch devices in series with the solenoid coil between a supply voltage and an earth connection, and including logic circuitry operatively associated with each switch device and operable to control switching of the respective switch device in accordance with certain parameters, the switch circuit being in combination with a monitoring circuit which is operable to monitor the state of each of the two switch devices, the monitoring circuit being operatively associated with the logic circuitry and being adapted to respond to one of the switch devices being in its conducting state when the other switch device is switched off, by changing the state of a logic signal in the logic circuitry associated with the other switch device and thereby inhibiting the other switch device from being switched to its conducting state.

4,599,676

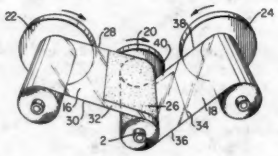
CAPACITOR WITH INTEGRAL DISCHARGE RESISTOR AND METHOD OF MAKING SAME

Ronald B. Rice, Monroe, Conn., and Theodore P. Kosnosky, Greer, S.C., assignors to Universal Manufacturing Corporation, Paramus, N.J.

Filed Feb. 13, 1985, Ser. No. 701,145

Int. Cl.[4] H01G *1/11, 4/38*

U.S. Cl. 361—275 **5 Claims**



1. A capacitor with an integral discharge resistor, which comprises:

a central core formed at least partially of an electrically resistive material, the central core including an inner support core section and an outer resistive core section, the inner and outer core sections being formed from an elongated sheet of paper material which is rolled about itself, the elongated sheet of paper material including a first portion impregnated with a resistive material, and a second portion of paper material, the elongated sheet being rolled so that the second portion of paper material defines the inner support core section and the first portion impregnated with the resistive material defines the outer resistive core section;

a sheet of electrically insulating material having first and second outer edges;

first and second sheets of electrically conductive material in spaced, opposed relationship, the electrically insulating sheet being disposed therebetween, the first conductive sheet extending outwardly at least up to said second edge, there being provided a first non-conductive margin along the first edge at which the first electrically conductive sheet cannot be contacted, the second conductive sheet extending outwardly at least to the first edge, there being provided a second non-conductive margin along the second edge at which electrical contact cannot be made with the second conductive sheet, the first and second sheets of electrically conductive material and the sheet of electrically insulating material being in the form of elongated strips and being wound into consecutive convoluted layers about the central core to form a capacitor, the width of the sheet of electrically insulating material being defined by the first and second edges thereof, the central core extending at least to the first and second edges of the insulating sheet;

first connecting means disposed at the second edge for providing an electrical connection between the first conductive sheet and one end of the central core; and

second connecting means disposed at the first edge for providing an electrical connection between the second conductive sheet and the other end of the central core.

4,599,677

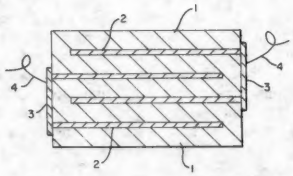
CAPACITIVE ENERGY STORAGE DEVICE FOR USE AT CRYOGENIC TEMPERATURES

William N. Lawless, and C. Frederick Clark, Jr., both of c/o CeramPhysics, Inc., P.O. Box 346, Westerville, Ohio 43081

Filed Jun. 1, 1984, Ser. No. 616,508

Int. Cl.[4] H01G *4/12;* **C04B** *35/46*

U.S. Cl. 361—321 **8 Claims**



1. A capacitive energy storage device for use at cryogenic temperatures comprising first and second electrodes having a layer of dielectric material therebetween, said dielectric material consisting essentially of a pyrochlore ferroelectric ceramic having the formula:

$$(Cd_{1-x}Pb_x)_2(Nb_{1-y}Ta_y)_2O_7$$

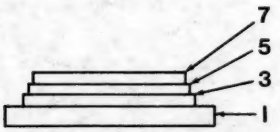
where x and y are numbers in the range of from 0 to 1.

4,599,678

PLASMA-DEPOSITED CAPACITOR DIELECTRICS

Michael R. Wertheimer, 91 Sommerville Ave., Westmount, Quebec, Canada (H3Z 1J4), and Tyamagondlu S. Ramu, No. 172, 2nd Main, 3rd Cross, "Srividya", Mahalaxmi Layout, Bangalore 560086, India

Filed Mar. 19, 1985, Ser. No. 713,638
Int. Cl.[4] H01G *4/08;* H01L *29/12;* B32B *9/04*
U.S. Cl. 361—323 25 Claims



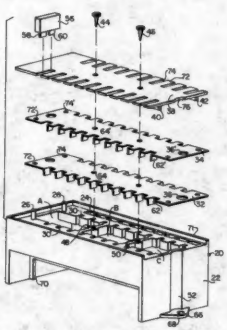
20. A thin film capacitor characterized in that said capacitor comprises a plasma-deposited silicon compound thin film dielectric material, such film being produced in a glow discharge with a substrate heated to a temperature in excess of 50° C.

4,599,679

FUSE BUS BAR ASSEMBLY

Edward J. Bander, 232 Stephen La., Springfield, Ohio 45505

Filed Aug. 3, 1984, Ser. No. 637,257
Int. Cl.[4] H02B *1/20*
U.S. Cl. 361—361 15 Claims



1. A fuse bar bus assembly for use in electrical systems employing fuses comprising:

a. a non-conducting housing including a support platform for a pair of bus bars and a receptacle support for a plurality of electrical terminals;

b. a pair of metallic bus bars supported in said housing on said support platform, each bus bar having a battery contact portion and a plurality of downwardly bent tangs, said bus bars being mated 180° out-of-phase with tangs from one bus bar abutting with tangs from the other bus bar and thereby forming adjancent pairs, such that said adjacent pairs of downwardly bent tangs define resilient seats for electrical contact with fuse blades; and

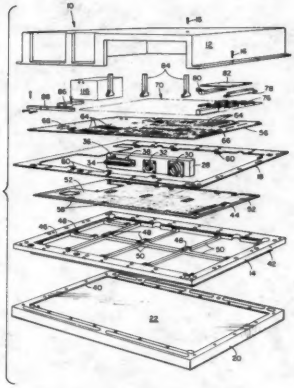
.. a cover for said pair of bus bars, said cover being seated on top of said bus bars in said housing.

4,599,680

PACKAGING ARRANGEMENT FOR SPACECRAFT COMPUTER

William C. Gibson; William M. Tomlinson; Eugene T. Goldstein, and George A. Ferguson, all of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Sep. 26, 1983, Ser. No. 535,653
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—386 12 Claims



1. A packaging arrangement for a computer capable of operating in a vacuum, said packaging arrangement comprising:

a base plate;

at least one circuit board generally parallel with said base plate and mounted on said base plate, said circuit board having internal connections formed integral therewith;

heat conductive plane means layered on top of said circuit board, said heat conductive plane means having slots therein;

integrated circuits mounted on said heat conductive plane for conducting heat thereto with leads for said integrated circuits extending through said slots into predesigned socket holes in said circuit board;

means for conducting heat from said circuit board and said heat conductive plane means to said base plate, said base plate being adapted for a heat conductive mounting on a cold plate;

connector means secured on said base plate for allowing external connections to computer;

cover means attached to said base plate for totally enclosing said computer;

said cover means, base plate, heat conductive plane means and means for conducting heat being both heat conductive and electrically conductive to (1) transfer heat from said integrated circuits or other heat generating components through said base plate to said cold plate, and (2) reduce electromagnetic interference whether internal or external to said computer.

4,599,681

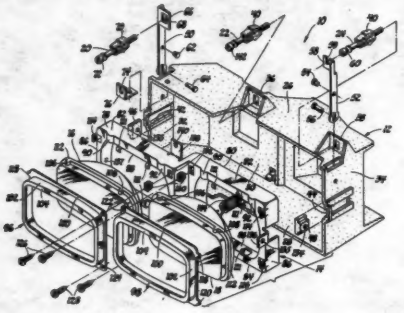
VEHICLE HEADLAMP ASSEMBLY

David R. McMahan, and Richard W. Nicholas, both of Anderson, Ind., assignors to General Motors Corp., Detroit, Mich.

Continuation-in-part of Ser. No. 678,026, Dec. 4, 1984, abandoned. This application Jun. 10, 1985, Ser. No. 743,089
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 362—80 3 Claims

1. A headlamp assembly adapted to be attached to a vehicle body at the front end thereof for adjustable aiming movement about three pivot axes, said headlamp assembly including a

support housing, a support bracket located within said support housing and adapted to support a pair of headlamp units in side by side relationship, said support bracket comprising a pair of side edges, a top edge and a bottom edge, said support housing including a pair of side walls, a top wall and a bottom wall which define a cavity for receiving said support bracket, a horizontally extending guide track formed in each of said pair of side walls of said support housing between said top wall and said bottom wall, each of said guide tracks supporting a block member for sliding movement relative to the associated side wall, pivot means connecting said block member of each of said side walls to said pair of said side edges of said support bracket so as to provide first and second pivot points which are horizontally aligned and laterally spaced to allow pivotal movement of said support bracket about a horizontal axis, a



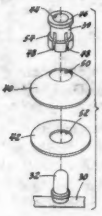
first adjustment screw carried by said support housing and connected to the block member providing said first pivot point, a second adjustment screw carried by said support housing and connected to the block member providing the second pivot point, and a third adjustment screw connecting said top edge of the support bracket to said top wall of said support housing, said third adjustment screw having a head providing a third pivot point, the arrangement being such that rotation of said third adjustment screw causes said support bracket to be adjusted about said horizontal axis while rotation of said first or second adjustment screws causes said support bracket to be adjusted about an inclined axis passing through said first and third pivot points and about an inclined axis passing through said second and third pivot points respectively so that subsequent rotation of said third adjustment screw causes said support bracket to be adjusted about a verticle axis.

4,599,682

POSITION RESPONSIVE LIGHTING APPAREL

Eugene Stephens, Southfield, Mich., assignor to DeVerohn Corporation, Southfield, Mich.

Filed Nov. 2, 1984, Ser. No. 667,808
Int. Cl.[4] F21L *15/08*
U.S. Cl. 362—103 **3 Claims**



1. Position-responsive lighting apparel, comprising:

a fabric-wearing member having cooperating fastener means for mounting the wearing member on the user;

a source of direct current power mounted in the wearing member;

a light-emitting diode;

circuit means connecting the source of direct current and the light-emitting diode including position-responsive means connected such that the light emitting diode is illuminated depending upon the attitude of the wearing member;

means for mounting the light-emitting diode on the wearing member comprising;

a partially spherical, reflective member having a central opening and a convex reflecting surface, the reflective member being mounted on the wearing member; and

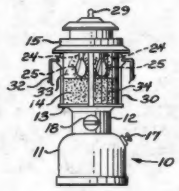
means in the central opening for engaging and supporting the light-emitting diode in a position with respect to the convex reflective surface that the reflective surface spreads the illumination emitted by the diode.

4,599,683

LANTERN WITH TWO-POSITION GLOBE

Hugh C. Beckham, and Robert M. Bean, both of Wichita, Kans., assignors to The Coleman Company, Inc., Wichita, Kans.

Filed Jun. 22, 1984, Ser. No. 623,822
Int. Cl.[4] F21V *3/04*
U.S. Cl. 362—166 **9 Claims**



1. A one piece globe for a lantern having a light source and means for supporting said globe, the globe having upper and lower halves of substantially equal length, one of the portions being transparent and the other of the portions being frosted.

4. A lantern having a base for supporting a globe and a top for covering the globe, a light source between the base and the top, the light source being positioned above or below a centerline halfway between the base and the top, and a one piece globe between the base and the top, the globe having upper and lower portions of substantially equal length, one of the portions being transparent and the other of the portions being frosted, the globe being movable between upright and inverted positions, the transparent portion of the globe covering the light source when the globe is in the upright position and the frosted portion of the globe covering the light source when the globe is in the inverted position whereby the transparent portion of the globe can be positioned adjacent the light source to provide bright light and the frosted portion of the globe can be positioned adjacent the light source to provide subdued light.

4,599,684

LIGHT REFLECTOR SYSTEM

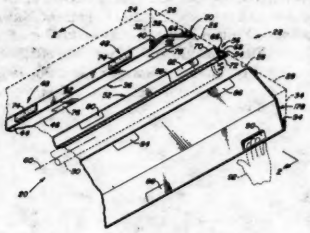
Richard H. Lee, 761 Panorama Dr., San Francisco, Calif. 94131

Filed Mar. 11, 1985, Ser. No. 710,545
Int. Cl.[4] F21V *7/12*
U.S. Cl. 362—346 **36 Claims**

1. A reflector assembly formed for retrofitting an existing fluorescent tube light fixture to improve the light emitting characteristics of the fixture, the light fixture including a housing having generally outwardly directed light reflecting interior surfaces including a top which resides behind the tubes when the tubes are in the fixture, and a first side and a second

side both extending outwardly in a similar direction away from opposite sides of the top, the assembly comprising:

(a) a first reflector structure, divided along a common edge into at least two smaller sections, the common edge forming a straight hinge-like joint aligned generally parallel to one of the sets of the opposite outside edges of the reflector structure, one of the opposite outside edges being formed with first means for securing the edge against the housing top and the other outside edge being formed with second means for securing the edge against one of the housing sides, this arrangement leaving the hinge-like joint free to be translated toward and away from the housing top and sides during installation, such that light



from the tube hitting the first reflector structure is reflected out of the housing without going back into the tube, and so the light experiences a minimum number of impacts with the reflecting surfaces inside the housing; and

(b) a second reflector structure, formed with a base away from which extends a ridge member having a V-shaped cross-section ending in a flexible hinge-like ridge edge, the ridge edge being parallel to the centerline of the fluorescent tube when the tube is mounted in the housing, the second reflector structure being attachable with its base against the housing top and positionable so the ridge edge underlies the tube centerline on a vertical line drawn from the tube centerline to the housing top.

4,599,685

CONTROL CIRCUIT FOR POWER CONVERTER APPARATUS

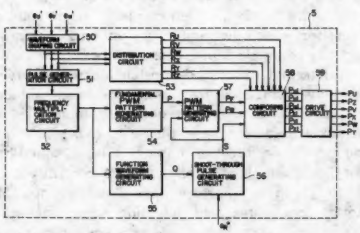
Mitsuyuki Hombu, Katsuta; Shigeta Ueda, Hitachi; Katsunori Suzuki, Takahagi, and Yasuo Matsuda, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 24, 1985, Ser. No. 694,668

Claims priority, application Japan, Jan. 25, 1984, 59-10118

Int. Cl.⁴ H02M 1/12

U.S. Cl. 363—41 **7 Claims**



1. In a power converter apparatus comprising a plurality of arms of self-extinction devices connected between a load and an AC source, and a capacitor connected between said AC source and said self-extinction devices, a control circuit for controlling said self-extinction devices by using a pulse width modulation signal, said control circuit comprising;

fundamental PWM pattern generating means for generating a predetermined fundamental PWM pattern signal having a pulse width which is sinusoidally varied in synchronism with a frequency of said AC source;

function waveform generating means for generating a predetermined function waveform signal synchronized with said fundamental PWM pattern signal;

shoot-through pulse generating means for generating a pulse having a predetermined pulse width and for shorting an output side of said power converter apparatus in a period of the pulse width; and

signal composing means for composing the fundamental PWM pattern from said fundamental PWM pattern generating means, the function waveform signal from said function waveform generating means, and the shoot-through pulse from said shoot-through pulse generating means and for applying said composed signals to said self-extinction devices to thereby sinusoidally vary pulse widths of input current pulses to said power converter apparatus.

4,599,686

METHOD AND APPARATUS FOR DRIVING A TRANSISTORIZED POLYPHASE PULSE INVERTER

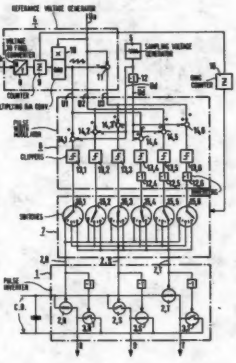
Manfred Müller, Nuremberg, and Karl Klausecker, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 30, 1984, Ser. No. 645,812

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1983, 3333408

Int. Cl.⁴ H02M 1/12

U.S. Cl. 363—41 **7 Claims**



6. Apparatus for forming pulse-width-modulated driving voltages for controlling a plurality of switches of a pulse inverter having a plurality of outputs and particularly a transistor inverter, comprising:

reference voltage generator means for generating a plurality of reference voltages selected in accordance with a symmetrical system of reference waveforms, said reference waveforms having a predetermined waveshape corresponding to the output voltages at the inverter outputs;

sampling voltage generator means for generating a sampling voltage having a frequency higher than a frequency of said reference waveform;

pulse-width-modulator means coupled to the reference voltage generator means for generating pulse-width-modulated reference voltages and pulse width modulated inverted reference voltages;

distributor circuit means having the pulse width modulated reference voltages and the pulse width modulated inverted

reference voltages coupled to respective inputs of the distributor circuit means and having outputs coupled to control lines of the switches of the pulse inverter;

said reference voltage generator means generating a plurality of reference voltages such that the reference voltages have respectively different waveforms, said reference voltages having segments coinciding with segments of said reference wave-form having the same phase spacing from respective zero-crossing points of said reference waveforms, each reference waveform segment associated with a corresponding segment of ones of said pulse width modulated reference voltages and pulse width modulated inverted reference voltages;

said distributor circuit means coupling selected ones of said pulse width modulated reference voltages and said pulse width modulated inverted reference voltages to selected ones of the control lines of the switches for generating said output voltages.

4,599,687

ELECTRICAL POWER SUPPLY FOR A MOTOR VEHICLE

Bernard R. Smith, North Perth, Australia, assignor to Ayr Pty. Ltd., East Victoria Park, Australia

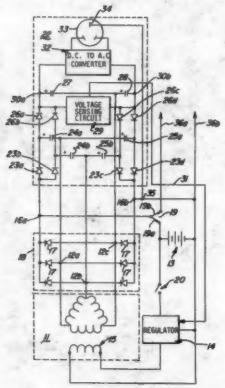
PCT No. PCT/AU84/00040, § 371 Date Nov. 1, 1984, § 102(e) Date Nov. 1, 1984, PCT Pub. No. WO84/03595, PCT Pub. Date Sep. 13, 1984

PCT Filed Mar. 9, 1984, Ser. No. 672,259

Claims priority, application Australia, Mar. 9, 1983, PF8363

Int. Cl.[4] H02M *7/02*

U.S. Cl. 363—61 **14 Claims**



1. An electrical power supply comprising:

a first input connected to a substantially direct current (D.C.) voltage source; a second input connected to a substantially alternating current (A.C.) voltage source; a capacitor bridge circuit including input capacitor means, output capacitor means in parallel with said input capacitor means, and diodes; and an output connected across said output capacitor means;

wherein said second input is provided in series with said input capacitor means, said first input is provided across said series connection of said input capacitor means and said second input and said diodes are configured to oppose discharge current flow from said output capacitor means to said input capacitor means, such that an effective cumulative charge is stored in the input capacitor means during one-half cycle of said A.C. voltage source, said charge being derived from the cumulative effect of said voltage sources on said input capacitor means, and said stored charge is transferred to said output capacitor means during the other half cycle of said A.C. voltage source together with the applied voltage of said A.C. voltage source during said other half cycle, thereby providing and sustaining a higher level of D.C. voltage at said output than obtained from said first input.

4,599,688

SEMICONDUCTOR MEMORY DEVICE HAVING SWITCHING CIRCUIT FOR PREVENTING CHANNEL LEAKAGE IN CONSTANT CURRENT SOURCE

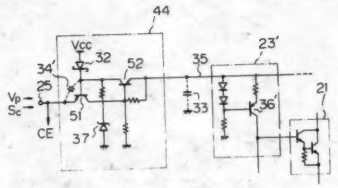
Kouji Ueno, and Tamio Miyamura, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 28, 1983, Ser. No. 508,544

Claims priority, application Japan, Jun. 30, 1982, 57-111536

Int. Cl.[4] G11C *17/00, 7/00*

U.S. Cl. 365—189 **11 Claims**



1. A semiconductor memory device operatively connected to receive a program control voltage and an input control signal, comprising:

a plurality of bit lines;

a plurality of word lines intersecting said plurality of bit lines;

memory cells connected at the intersections of said bit lines and word lines;

program circuits respectively connected to said bit lines, each of said program circuits being operative to write data to a memory cell when the corresponding one of said bit lines is selected during a write operation;

a constant current source for supplying a write current to the one of said program circuits corresponding to the selected memory cell;

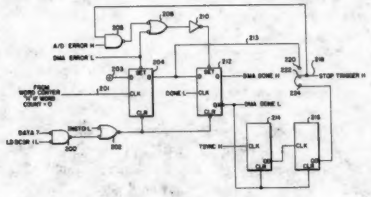
a control terminal, operatively connected to said constant current source, for receiving, during the write operation, a program control voltage to be applied to the constant current source, and for receiving the input control signal during operations other than the write operation; and

a switching circuit, connected between said control terminal and said constant current source, for supplying the program control voltage to said constant current source only during the write operation, said switching circuit including a switching element connected in series between said control terminal and said constant current source, said switching element being turned on when said control terminal recieves a signal having a voltage level which exceeds a predetermined voltage level which is greater than the voltage level of the input control signal but less than the voltage level of the program control voltage, so that the program control voltage is supplied to said constant current source, said switching element being turned off when said control terminal receives a signal having a voltage level lower than the predetermined voltage level, so that a voltage supplied to said constant current source is maintained at a level which is not high enough to operate said program circuits.

4,599,689
CONTINUOUS DATA TRANSFER SYSTEM

Ari P. Berman, Ashland, Mass., assignor to Data Translations, Inc., Marlboro, Mass.

Filed Feb. 28, 1983, Ser. No. 470,402
Int. Cl.[4] G06F *3/00, 12/02, 13/00*
U.S. Cl. 364—200 **9 Claims**



1. Computer apparatus for continuously transferring data words from a peripheral unit to a plurality of buffer memories, each of said buffer memories having a plurality of storage locations for storing a predetermined number of data words, said apparatus comprising,

plurality of overrun memories, each of said overrun memories having a predetermined number of storage locations and being assigned to one of said plurality of buffer memories,

means for sequentially transferring data words from said peripheral unit to sequential storage locations in a first one of said buffer memories, said transferring means transferring words to sequential storage locations in said overrun memory assigned to said first buffer memory when said first buffer memory is filled with data words,

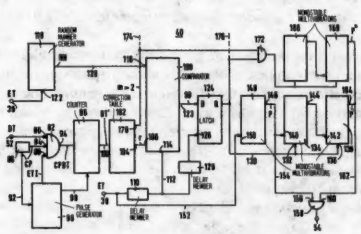
means for counting the number of data words transferred by said transferring means to said first buffer memory and said overrun memory, said counting means generating an interrupt signal when said first buffer memory becomes filled with data words,

means responsive to said interrupt signal for controlling said transfer means to transfer data words from said peripheral unit to a second one of said buffer memories starting at a location spaced from the beginning of said second buffer memory a number of locations equal to the number of data words stored in said overrun area.

4,599,690
METHOD AND CIRCUIT FOR CORRECTING COUNT RATE LOSSES OF RADIATION EVENTS

Everett W. Stoub, Villa Park, Ill., assignor to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Nov. 9, 1983, Ser. No. 549,866
Int. Cl.[4] G01T *1/20*
U.S. Cl. 364—414 **20 Claims**



7. A circuit for correcting count rate losses of radiation events measured by a radiation detector due to detector deadtimes during an acquisition time, comprising:

(a) means for detecting radiation events which are subject to deadtime losses during the acquisition time to obtain a succession of radiation detector event triggers;

(b) means for providing for each detected radiation event a deadtime signal which corresponds to the deadtime generated by the detected radiation event;

(c) means for subdividing the acquisition time into a succession of evaluation time intervals;

(d) means for measuring the fractional amount of deadtime within each evaluation time interval to obtain a measure for count rate losses;

(e) means for evaluating from the fractional amount of deadtime a replication probability r according to the equation

$$r = DT'/(1-DT')\,(m-1),$$

wherein DT' is the fractional amount of deadtime and m is a replication number only so large as to make the replication probability be less than one for any particular fractional amount of deadtime; and

(f) means for evaluating all radiation events detected between the ene of one evaluation time and the end of a following one to generate

(f1) one pulse for each detected radiation event between the ends of the succeeding evaluation times; and

(f2) a sequence of a number of pulses for randomly selected events which selection corresponds to the replication probability and which pulse number corresponds to the replication number.

4,599,691
TREE TRANSFORMATION SYSTEM IN MACHINE TRANSLATION SYSTEM

Hiroshi Sakaki, and Kazuo Hashimoto, both of Tokyo, Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed May 13, 1983, Ser. No. 494,361
Claims priority, application Japan, May 20, 1982, 57-83961
Int. Cl.[4] G06F *15/38*
U.S. Cl. 364—419 **1 Claim**

1. A machine translation system (FIG. 7) which generates sentences in target language using tree structure expression in source language comprising;

a pattern dictionary (PTD, FIG. 7) for storing a table of target language and source language,

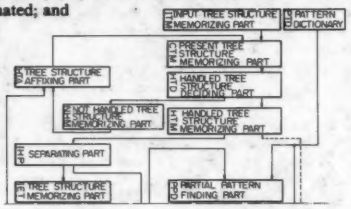
means (PPD, FIG. 7) having at least a first shift register (PPA) having source tree patterns from said pattern dictionary, a second shift register (PPB) having source tree which is to be translated, a coincidence detector (CSD) for comparing outputs of said first (PPA) and second (PPB) shift registers; for providing coincident pattern of patterns contained in the pattern dictionary and partial pattern of tree structure in source language including the topmost mode of said tree structure;

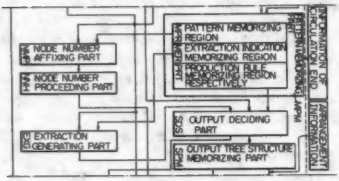
means (SDS, FIG. 7) for producing a pattern in said target language and an instruction to lower layer utilizing the information of information from instruction from upper layer, extraction information (EXG, FIG. 7), and production rule (stored in PRT, FIG. 7) peculiar to said coincident pattern;

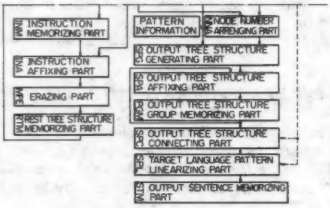
means (INA, MPE, FIG. 7) having a first shift register (AAA) storing said instruction to lower layer, a second shift register (AAB) storing said tree structure, AND-OR logic means for coupling the output of said first shift register (AAA) to the output of said second shift register (AAB) to eliminate said coincident pattern;

means (SPC, FIG. 7) having a first shift register (UAA) storing separated partial target trees, a second arithmetic register (UAB) for performing operation to signal in said first shift register (UAA), and a third shift register (UAC) for storing the output of said second register (UAB), so as to produce a final target language tree which is connected

to the result of said partial target tree through repeating said means (SPC) until the whole of said tree structure is eliminated; and


INPUT TREE STRUCTURE MEMORIZING PART
PATTERN DICTIONARY
PRESENT TREE STRUCTURE MEMORIZING PART
TREE STRUCTURE AFFIXING PART
HANDLED TREE STRUCTURE DECIDING PART
NOT HANDLED TREE STRUCTURE MEMORIZING PART
HANDLED TREE STRUCTURE MEMORIZING PART
SEPARATING PART
TREE STRUCTURE MEMORIZING PART
PARTIAL PATTERN FINDING PART


PATTERN MEMORIZING REGION
EXTRACTION INDICATION MEMORIZING REGION
PRODUCTION RULE MEMORIZING REGION RESPECTIVELY
NODE NUMBER AFFIXING PART
NODE NUMBER PROCEEDING PART
OUTPUT DECIDING PART
EXTRACTION GENERATING PART
OUTPUT TREE STRUCTURE MEMORIZING PART
INFORMATION OF END OF ARRANGEMENT


INSTRUCTION MEMORIZING PART
INSTRUCTION AFFIXING PART
ERAZING PART
REST TREE STRUCTURE MEMORIZING PART
PATTERN INFORMATION
NODE NUMBER ARRENGING PART
OUTPUT TREE STRUCTURE GENERATING PART
OUTPUT TREE STRUCTURE AFFIXING PART
OUTPUT TREE STRUCTURE GROUP MEMORIZING PART
OUTPUT TREE STRUCTURE CONNECTING PART
TARGET LANGUAGE PATTERN LINEARIZING PART
OUTPUT SENTENCE MEMORIZING PART

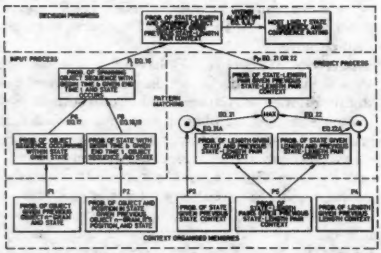
means (SPL, FIG. 7) for receiving the output of said SPC means and generating final sentence in target language.

4,599,692

PROBABILISTIC LEARNING ELEMENT EMPLOYING CONTEXT DRIVE SEARCHING

Chuan-Chieh Tan, Orange; Thomas B. Slack, Oxford, and Jeffrey N. Denenberg, Trumbull, all of Conn., assignors to ITT Corporation, New York, N.Y.

Filed Jan. 16, 1984, Ser. No. 571,223
Int. Cl.[4] G06K *9/62;* **G06F** *1/00, 15/00*
U.S. Cl. 364—513 **20 Claims**



1. A probabilistic learning element, that sequentially receives objects and outputs sequences of recognized states and includes context driven searching, said learning element comprising:

means for sequentially receiving objects;

long term memory means for storing in sequential context, previously learned states,

objects contained in said previously learned states, and

predetermined types of knowledge relating to said stored previously learned states and said objects contained in said previously learned states, whereby from any stored information in

said long term memory means the stored information which occurs next in context is directly accessible;

short term memory means for storing in sequential context said received objects;

means for correlating said received objects stored in said short term memory means with information stored in said long term memory means, said correlation being facilitated by using the context of said objects stored in said short term memory means as a pointer to the context of said information stored in said long term memory means, said correlating means assigning probabilities to possible next states in a sequence of recognized states;

means, responsive to said probabilities of possible next states, for determining a most likely next state;

means, responsive to said objects stored in said short term memory means and said information stored in said long term memory means, for providing a signal corresponding to a probability that a state has ended; and

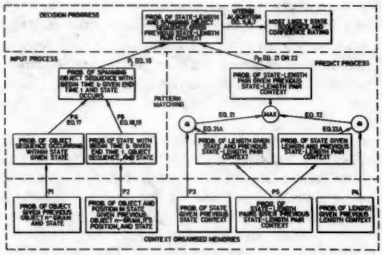
means, responsive to said end of state signal, for outputting said most likely next state as a recognized next state in a recognized state sequence.

4,599,693

PROBABILISTIC LEARNING SYSTEM

Jeffrey N. Denenberg, Trumbull, Conn., assignor to ITT Corporation, New York, N.Y.

Filed Jan. 16, 1984, Ser. No. 571,222
Int. Cl.[4] G09C *1/00;* **G06K** *9/62;* **G06F** *15/18*
U.S. Cl. 364—513 **23 Claims**



19. A probabilistic learning system that receives sequential input data and outputs sequences of recognized patterns, comprising:

an array of interconnected probabilistic learning elements that receives sequences of objects and output sequences of recognized states, said array of learning elements being interconnected to have a number of input learning elements and a number of output learning elements the sequences of recognized states from predetermined learning elements being combined to form objects to be received by other learning elements of the array;

means for receiving and partitioning the input data between the input learning elements of the array in an overlapping and redundant manner, whereby the partitioned input data become objects provided to the input learning elements; and

means for collecting and combining the recognized state se-

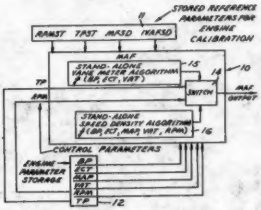
quences from the output learning elements of the array and for providing a sequence of recognized patterns as an output of the probabilistic learning system, whereby the reliability of the learning system is enhanced due to the overlapping and redundant nature in which the input data is processed through the system and the time required to perform the system task is reduced through the use of parallel processing through the array.

4,599,694

HYBRID AIRFLOW MEASUREMENT

Alexander Aposchanski, Canton; Arthur J. Buglione, Garden City; James M. Coats, Ypsilanti, all of Mich., and Brian S. Edelman, Hiroshima, Japan, assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 7, 1984, Ser. No. 618,021
Int. Cl.[4] G06F *15/20*; F02D *5/02*
U.S. Cl. 364—431.05 **2 Claims**



1. An engine control system for determining airflow by selecting between a calculated airflow using engine speed and air density and a measured airflow using an air meter, comprising:

air flow meter means for sensing a parameter characterizing airflow into the engine;

calculation means for calculating airflow into the engine as a function of engine speed and air density;

selection means choosing either the output of said airflow meter or said calculation means to determine the amount of air entering the engine;

storage mens for storing engine operating parameters of engine speed;

reference means for storing a reference engine speed;

said selection means including:

a first hysteresis flip-flop circuit having a set input of "1" when engine speed is less than or equal to a first threshold engine speed for switching to using a calculated airflow from a measured airflow and having a set input of "0" when engine speed is greater than the first threshold engine speed;

said first hysteresis flip-flop having a clear input of "1" when engine speed is greater than the sum of the first threshold engine speed and a second threshold engine speed for switching to a measured airflow and having otherwise, when the engine speed is less than or equal, a clear input of "0";

a second hysteresis flip-flop having a set input of "1" when the average measured airflow is less than a threshold airflow for switching to using a calculated airflow and having otherwise, when measured airflow is greater than or equal, a set input of "0";

said second hysteresis flip-flop having a clear input of "1" when the average measured airflow is greater than the sum of the threshold airflow plus an additional hysteresis airflow for switching to use measured airflow, and having otherwise, when measured airflow is less than or equal, a clear input of "0";

a third hysteresis flip-flop having a set input of "1" when an air meter correction factor is less than or equal to a threshold calculated airflow for switching to using a calculated airflow and having otherwise, when the air meter correction factor is greater than, a set input of "0";

said third hysteresis flip-flop having a clear input when the air meter correction factor is greater than the sum of the threshold calculated airflow plus an additional hysteresis airflow for switching to using measured airflow and otherwise, when the air meter correction factor is less than or equal to, a clear input of "0";

a first AND gate having a first input of "1" when airflow is being determined by calculated airflow and "0" when air is being determined by measured airflow;

said first AND gate having a second input of "1" when engine speed is less than or equal to a minimum engine speed to allow transition from calculated to measured airflow, and otherwise, when engine speed is greater than a second input of "0";

a second AND gate having as three inputs the three outputs of said first, second and third hysteresis flip-flops;

an OR gate having as two inputs the output of, said first and second AND gates; and

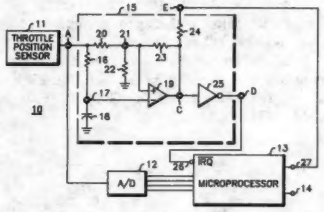
said OR gate having an output indicating a selection of using calculated airflow when the OR output is "1" and using measured airflow when the OR output is "0".

4,599,695

MICROPROCESSOR TRANSIENT INTERRUPT SYSTEM ADAPTABLE FOR ENGINE CONTROL

Robert Deutsch, Sugar Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 25, 1984, Ser. No. 614,352
Int. Cl.[4] G06F *9/46*; F02D *41/28*; F02P *5/15*
U.S. Cl. 364—431.11 **20 Claims**



1. A microprocessor transient interrupt system comprising:

microprocessor means for effectively monitoring at a first rate at least one input signal and providing at least one control output signal in response thereto in accordance with a predetermined main software program which implements a first predetermined relationship between said input and output signals, said microprocessor means including, internal thereto, interrupt means for interrupting said main software program and implementing an interrupt software program in response to receiving an interrupt signal and then reimplementing said main software program; and

transient detector means coupled to and located external to said microprocessor means for substantially continuously monitoring a sensed parameter and providing said interrupt signal to said microprocessor means in response to detecting a predetermined change in said parameter indicative of the start of a transient condition of said parameter;

said microprocessor means including disable means for, in response to said interrupt program, effectively preventing any additional execution of said interrupt software program after said interrupt program for a time duration calculated by said microprocessor means indicative of the continued existence of said transient condition, whereby said microprocessor prevents additional interrupts by said transient detector means during said time duration.

11. An engine control microprocessor transient interrupt system comprising:

sensor means for providing an input signal related to throttle position of an engine;

microprocessor means coupled to said sensor means for effectively monitoring at a first rate at least said input signal and providing at least one engine control output signal in response thereto in accordance with a predetermined main software program which implements a first predetermined relationship between said input and output signals, said microprocessor means including, internal thereto, interrupt means for interrupting said main software program and implementing an interrupt software program in response to receiving an interrupt signal and then reimplementing said main software program; and

transient detector means coupled to and located external to said microprocessor means for substantially continuously monitoring a sensed engine parameter and providing said interrupt signal to said microprocessor means in response to detecting a predetermined change in said parameter indicative of the start of a transient condition of said parameter;

said microprocessor means including disable means for, in response to said interrupt program, effectively preventing any additional execution of said interrupt software program after said interrupt program for a time duration calculated by said microprocessor means indicative of the continued existence of said transient engine condition, whereby said microprocessor prevents additional interrupts by said transient detector means during said time duration.

4,599,696

SYSTEM FOR DIAGNOSING AN INTERNAL COMBUSTION ENGINE

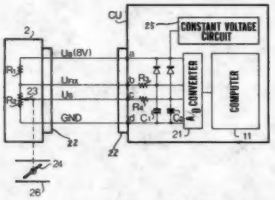
Toshio Takahashi, Mitakashi, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1983, Ser. No. 535,512

Claims priority, application Japan, Sep. 30, 1982, 57-171505

Int. Cl.[4] F02D *5/00;* **G06F** *11/30*

U.S. Cl. 364—431.11 **10 Claims**



1. A system for diagnosing an internal combustion engine comprising

an air-flow meter including a variable resistor responsive to volume of intake air of the engine for producing an output voltage and having a movable contact, one end of the variable resistor being connected to a fixed voltage terminal normally having a fixed voltage, the other end of the variable resistor being connected to a ground terminal, and the movable contact of the variable resistor being connected to a variable voltage terminal, voltage between the movable terminal and the ground terminal being responsive to the volume of the intake air of the engine for producting said output voltage,

a first smoothing capacitor connected between the variable voltage terminal and the ground terminal for charging thereon said output voltage of the air-flow meter,

a second smoothing capacitor connected between said fixed voltage terminal and the ground terminal for charging thereon said fixed voltage,

means comprising a diagnosing circuit for detecting a fault of the air-flow meter for producing a diagnosis signal when said fixed voltage varies beyond a predetermined range which is smaller than the range of fluctuation of the output voltage at the movable contact, so as to diagnose a fault of the air-flow meter.

4,599,697

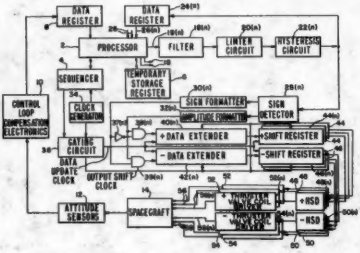
DIGITAL PWPF THREE AXIS SPACECRAFT ATTITUDE CONTROL

Fred N. Chan, Atherton, and Frank C. Nilsen, Mountain View, both of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Aug. 11, 1982, Ser. No. 407,196

Int. Cl.[4] B64G *1/26*

U.S. Cl. 364—434 **8 Claims**



7. An apparatus for controlling the attitude of a spacecraft with respect to each of three orthogonal reference axes, comprising:

means for imparting angular velocity to the spacecraft about each of three orthogonal spacecraft axes that are fixed with respect to the spacecraft;

means for measuring the angle between each spacecraft axis and a corresponding one of the reference axes, and for measuring the angular velocity of the spacecraft about each of the spacecraft axes; and

means for periodically observing output signals produced by the measuring means and creating in response thereto a pulsetrain signature for each spacecraft axis for aligning said spacecraft axis with its corresponding reference axis;

wherein each pulsetrain signature has a varying number of pulses of varying duration, and is loaded into a shift register which piecewise outputs a signal for alternately switching on and off the imparting means for the corresponding spacecraft axis in response thereto;

said apparatus further comprising means for splitting each of said pulses into several bits of shorter duration each having the same amplitude as its precursor pulse;

wherein the bits are loaded into the shift registers for subsequent piecewise outputting to the imparting means.

4,599,698

AIRCRAFT TRIM ACTUATOR SHUTDOWN MONITOR SYSTEM AND METHOD

William C. Fischer, Monroe; Don L. Adams, Fairfield; Stuart C. Wright, Milford, and David J. Verzella, Guilford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 2, 1983, Ser. No. 490,698

Int. Cl.[4] G05D *1/00, 23/02;* **G06F** *15/20*

U.S. Cl. 364—551 **39 Claims**

1. Apparatus for selectively disabling the trim actuator of an aircraft outer loop axis control channel having an inner loop stability augmentation system (SAS) actuator which in combi-

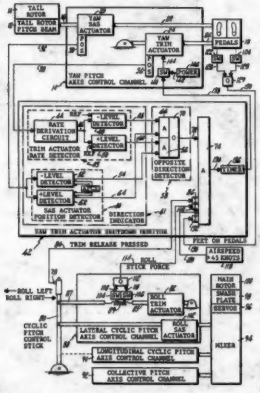
nation with the trim actuator maintains aircraft attitude in an associated control axis, each actuator capable of reciprocating motion within a related range of position values, and each having a position sensor for providing a signal indicative of the actual actuator position value in the range, the rate of change of position and direction of travel of the trim actuator determinating the position and direction of travel of the SAS actuator to provide, in combination, supportive effect on the aircraft attitude in the associated axis, the apparatus comprising:

direction indicating means, responsive to each actuator position signal, for providing a trim actuator direction signal indicative of the direction of travel of the trim actuator at a rate of change of position, and for providing a SAS actuator direction signal indicative of the direction of travel of the SAS actuator within a selected range of SAS actuator position values;

opposite direction detector means, responsive to said direction indicating means, for providing a trim actuator disable signal in response to the simultaneous presence of said trim actuator direction signal and said SAS actuator direction signal indicating directions of travel having opposing effects on the aircraft attitude in the control axis; and

means for disabling operation of the trim actuator in response to the presence of said trim actuator disable signal.

36. A method for monitoring and selectively disabling a trim



actuator in an aircraft outer control loop having an inner control loop stability augmentation system (SAS) actuator which in combination with the trim actuator maintains aircraft attitude in an associated control axis during flight, each actuator capable of reciprocating motion within a related range of position values, and each having a position sensor for providing a signal indicative of the actual actuator position value in the range, the rate of change of position and direction of travel of the trim actuator determining the position and direction of travel of the SAS actuator to provide, in combination, supportive effect on the aircraft attitude in the associated axis, and the aircraft having a coupled flight director system (CFD), comprising the steps of:

determining the value of the rate of change of position of the trim actuator,

defining a selected range of trim actuator position rate values,

comparing the determined trim actuator position rate value to said selected range of rate values and establishing in response to a determined rate value magnitude within said selected range of rates, a trim actuator direction state indicative of the direction of travel of the trim actuator,

defining a selected range of SAS actuator position values,

comparing the magnitude of the SAS actuator position signal value to said selected range of position values and establishing, in response to a position signal value magnitude within said selected range of positions, a SAS actuator direction state indicative of the direction of travel of the SAS actuator within said selected range of SAS actuator position values.

detecting the simultaneous presence of said trim actuator direction state and said SAS actuator direction state indicating directions of travel having opposing effects on the aircraft attitude in the control axis, and providing a trim actuator disable signal in response thereto,

disabling operation of the trim actuator in response to the presence of said trim actuator disable signal.

4,599,699

CIGARETTE MANUFACTURING MACHINES

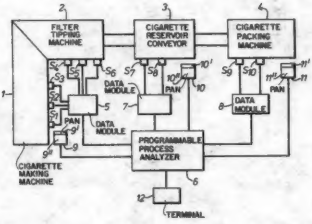
Adrian R. Stewart-Cox, Eastleigh, and Robert G. Bryant, Totton, both of England, assignors to British-American Tobacco Company Limited, London, England

Filed May 27, 1983, Ser. No. 498,795

Claims priority, application United Kingdom, Jun. 1, 1982, 8215877

Int. Cl.[4] **G06F** *11/22, 15/36*

U.S. Cl. 364—552 **19 Claims**



16. A monitoring system comprising programmable process analyzer means and display means, wherein said process analyzer means is operable to receive, during periods between stoppages of cigarette manufacturing machinery, comprising a rod-making machine, signals indicative of a number of process condition variables, each of which can have a normal or a non-normal status, to make comparisons of sets of said signals with predetermined respective profiles for the said sets, which profiles contain at least some non-normal signal statuses, a matching of one of said sets with the associated predetermined profile being indicative of the causal process event appertaining to a machine stoppage, and to cause a message indicative of said event to be displayed by said display means upon the occurrence of a said matching.

4,599,700

PROCESS AND DEVICE FOR DIGITAL FREQUENCY GENERATION

Guy P. Kerdoncuff, Perros Guirec, and Jacques H. Provendier, Lannion, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Continuation of Ser. No. 410,079, Aug. 20, 1982, abandoned. This application May 6, 1985, Ser. No. 731,597

Claims priority, application France, Aug. 28, 1981, 81 16441

Int. Cl.[4] **G06F** *1/02*

U.S. Cl. 364—721 **2 Claims**

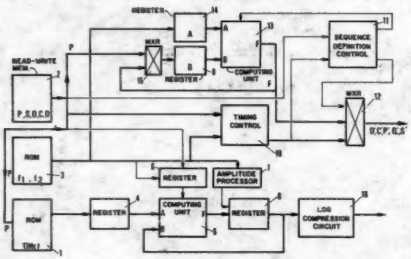
1. In a digital frequency generator for selectively generating continuous or discontinuous mono-frequency or bi-frequency signals having at least one component E represented by the expression $E=\sin 2\pi ft$, where t represents time and f represents frequency, said component taking the form of a series of samples x_p represented by $x_p=\sin 2\pi f_p T$ of rank p, p, being an integer having a value in the range 1 to p, a device for providing said series of samples x_p comprising:

read only memory means for storing n samples x_p, said n samples corresponding to n different values of the function $\sin 2\pi t$ at successive instants of time $t_1=1/F$, $t_2=2/F$,

. . . $t_n = n/F$, where F is the sampling frequency at which said n different values are obtained;

read/write memory means for storing parameters of each of said samples in the form of a triplet P, Q, S where P is the absolute value sin $2\pi PT$ of the sample of rank p and Q and S define a quadrant of a trigonometric circle containing the sample;

addressing means responsive to the rank P of the sample furnished by said read/write memory means for addressing the samples stored in said read only memory means and "biunivocally" providing an addressed sample Y_N of rank p of the signal to be generated from the sample of rank pf of the function sin $2\pi t$ contained in the read only



memory, wherein "biunivocally" means that one and only one sample of rank p of the signal to be generated corresponds to each sample of pf contained in the read only memory, and one and only one sample of the rank pf contained in the read only memory corresponds to each sample of rank p of the signal to be generated; and

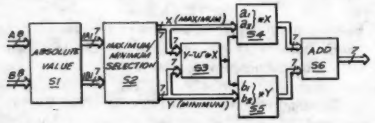
computing means responsive to the addressed sample Y_N provided by said read only memory means and to the triplet parameters P, Q, S of the addressed sample stored in said read/write memory means and indicative of the sample of instant pT, and without any operator intervention, for providing the further triplet P', Q', S' representative of the sample $x_{(p+1)}$ for the instant of time (p+1)T.

4,599,701

COMPLEX MAGNITUDE COMPUTATION

William M. Vojir, Seaford, and Cecelia Jankowski, East Norwich, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Oct. 19, 1983, Ser. No. 543,333
Int. Cl.[4] G06F 7/552
U.S. Cl. 364—752 **9 Claims**



1. A circuit for calculating the magnitude r of a complex number Z represented by inphase and quadrature signals A and B, respectively, comprising:

(1) means for deriving signals related to the absolute values of signals A and B;

(2) means for selecting the maximum (signal X) and minimum (signal Y) as between said absolute value signals;

(3) means for multiplying signal X by a selected one or more of a plurality of X signal coefficients $a_1 \ldots a_n$ and for multiplying signal Y by a selected one or more of a plurality of Y signal coefficients $b_1 \ldots b_n$;

(4) means responsive to said X and Y signals for selecting the operative coefficients a_n, b_n forming the a_nX and b_nY products; and

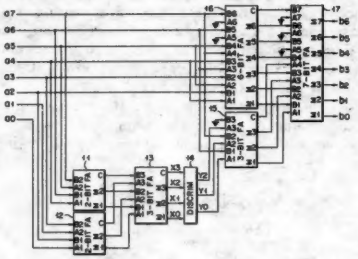
(5) means for combining said products to derive a signal relating to the magnitude r.

4,599,702

DIVIDER CIRCUIT FOR DIVIDING N-BIT BINARY DATA USING DECIMAL SHIFTING AND SUMMATION TECHNIQUES

Shigenori Tokumitsu, Fukaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 22, 1983, Ser. No. 525,490
Claims priority, application Japan, Aug. 27, 1982, 57-148813
Int. Cl.[4] G06F 7/52
U.S. Cl. 364—764 **8 Claims**



1. A divider circuit for dividing n-bit binary data L_n by a number m which is defined as $m = 2^a - 1$ where a is a positive integer of 2 or greater, the division operation L_n/m being developed into an infinite series given as:

$$L_n/m = \sum_{b=1}^{\infty} L_{(n-ba)}$$

for $L_{(n-ba)} = L_n/2^{ba}$

(where b is a positive integer), said divider circuit comprising:

first means, responsive to said binary data L_n, for sectioning a decimal part of a plurality of most significant terms of said infinite series from an integer part of said most significant terms, each said decimal part sectioned into a unit of a-bits from the most significant bits of the decimal part where a is said positive integer ≥ 2, and for summing said sectioned decimal part units of said plurality of terms of said infinite series to generate a summed decimal part;

second means coupled to said first means, for discriminating an integer part carry from said summed decimal part to be added to the integer part of said binary data L_n; and

third means coupled to said second means and responsive to said binary data L_n, for summing sections of integer parts of said binary data L_n, thereby producing a sum of integer parts, and for adding said integer part carry produced by said second means to said sum of integer parts to thereby provide a divided data result corresponding to L_n/m.

4,599,703

LOW FREQUENCY AC WAVEFORM GENERATOR

Oscar W. Bilharz, Scotia, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

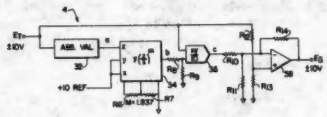
Filed Nov. 22, 1983, Ser. No. 554,413
Int. Cl.[4] G06G 7/26
U.S. Cl. 364—851 **31 Claims**

1. A circuit for synthesizing the sine of an angle from a first signal representative of the angle comprising:

input means receiving said first signal;

absolute value determination means connected to said input means for producing a second signal having a voltage equal to the absolute value of the voltage of said first signal;

exponential circuit means responsive to said second signal for producing a third signal having a voltage related to the voltage of said second signal by a predetermined power;



multiplication circuit means responsive to said first and third signals for producing a fourth signal having a voltage proportional to the product of the voltages of said first and third signals; and

summer circuit means responsive to said first and fourth signals for subtracting the voltage of said fourth signal from the voltage of said first signal to produce an output signal having a voltage indicative of the sine of the voltage of said first signal.

4,599,704

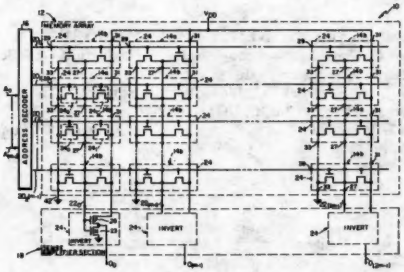
READ ONLY MEMORY CIRCUIT

Moshe Mazin, Andover, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 3, 1984, Ser. No. 567,842

Int. Cl.[4] G11C *17/00*

U.S. Cl. 365—104 **5 Claims**



1. A non-voltaile integrated circuit memory having an array of memory cells, each one of said memory cells in the array of memory cells being formed in a different region of the integrated circuit and being selectively programmable to store complementary binary data, each one of said memory cells comprising: an address terminal, a ground terminal, an output terminal, and a power supply terminal; and wherein a first set of said memory cells programmed into a first logical state is being provided with transistor action between the output terminal and the power supply terminal and being absent of transistor action between the output terminal and the ground terminal, and a second set of memory cells programmed to store the complementary logic state being absent transistor action between the output terminal and the power supply terminal while being provided with transistor action between the ground terminal and the output terminal and wherein, when in either programmed logical state, the transistor action is controlled by signals fed to the address terminal of the memory cells.

4,599,705

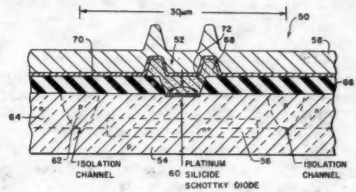
PROGRAMMABLE CELL FOR USE IN PROGRAMMABLE ELECTRONIC ARRAYS

Scott Holmberg, Milford, and Richard A. Flasck, Rochester, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation of Ser. No. 201,594, Oct. 28, 1982, abandoned, and a continuation-in-part of Ser. No. 103,011, Dec. 13, 1979. This application Sep. 10, 1984, Ser. No. 649,205

Int. Cl.[4] G11C *13/00, 11/42*

U.S. Cl. 365—163 **49 Claims**



1. A programmable cell comprising:

an amorphous cell body, said body including at least a portion having settable substantially non-resettable means, said means having a highly nonconductive state settable into a highly conductive state, said body formed from an amorphous material selected from the group consisting of (a) carbon or alloys thereof and (b) an alloy of one or more elements from the group consisting of carbon silicon and germanium with one or more density of states reducing elements.

4,599,706

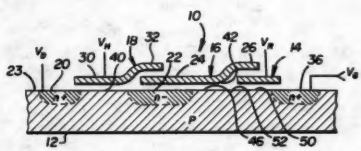
NONVOLATILE ELECTRICALLY ALTERABLE MEMORY

Daniel C. Guterman, Fremont, Calif., assignor to Xicor, Inc., Milpitas, Calif.

Filed May 14, 1985, Ser. No. 734,478

Int. Cl.[4] G11C *11/40*

U.S. Cl. 365—185 **29 Claims**



16. A nonvolatile floating gate device comprising:

a substrate of a first conductivity type having a first surface and a first substrate region disposed in said first surface, said first substrate region being of a second conductivity type opposite said first conductivity type;

first means for selectively applying one of a first data potential and a second data potential to said first substrate region, said first potential being applied when data to be stored in said device has one binary state, said second potential being applied when data to be stored in said device has the other binary state;

a first electrically insulated semiconductor layer;

second means for applying a bias potential to said first semiconductor layer;

a second electrically insulated semiconductor layer having a first portion capacitively coupled to said first layer and a said cond portion capacitively coupled to a preselected area of said first surface;

a third electrically insulated semiconductor layer having a

first portion capacitively coupled to said second portion of said second semiconductor layer and a second portion being capacitively coupled to said first surface and adjacent an edge of said first substrate region, said second portiion of said third layer being disposed generally intermediate said first substrate region and said second portion of said second layer;

third means for selectively applying a control potential to said third semiconductor layer, said control potential being selected to invert the conductivity type of said first surface capacitively coupled to said second portion of said third layer to said second conductivity type to electrically couple the potential of said first region to a portion of said surface of said substrate capacitively coupled to said second portion of said second semiconductor layer, each said potential being selected so that electrons are introduced onto said second layer from said first layer on application of the first potential to said region and said third potential to said third layer, and further so that electrons are removed from said second layer to said third layer upon application of said second potential to said first region and said third potential to said third layer;

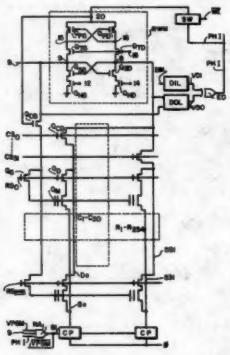
means for sensing the potential of said floating gate.

4,599,707

BYTE WIDE EEPROM WITH INDIVIDUAL WRITE CIRCUITS AND WRITE PREVENTION MEANS

Sheng Fang, Sunnyvale, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Mar. 1, 1984, Ser. No. 585,319
Int. Cl.[4] G11C *7/00, 11/40*
U.S. Cl. 365—185 **5 Claims**



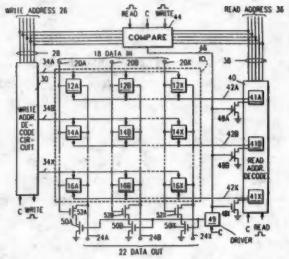
1. In a memory system of the EEPROM type including a plurality of sections of rows and columns of memory cells forming a plurality of bytes of memory, each section including a writing circuit having two terminals for charging and discharging its associated cells by applying differential voltages thereto, each row in each section including one memory cell for each column in the section, each section including the same number of rows and the same number of columns, each of the memory cells in the same row and column location in each section together comprising each byte of memory, the improvement comprising simplified selection means for each section connecting all of the memory cells in a selected row to one terminal (9) of an associated writing circuit and all of the memory cells of a selected column to the other terminal (8) of the associated writing circuit, each selection means including prevention means preventing the associated writing circuit from applying a charging or discharging differential voltage to any memory cell except that in both the selected row and the selected column, each said writing circuit being capable of changing information in an associated selected cell from a first state (discharged) to a second state (charged) or vice versa while another writing circuit is making the same or a different change in the information stored in its associated selected cell.

4,599,708

METHOD AND STRUCTURE FOR MACHINE DATA STORAGE WITH SIMULTANEOUS WRITE AND READ

Stanley E. Schuster, Granite Springs, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,216
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189 **8 Claims**



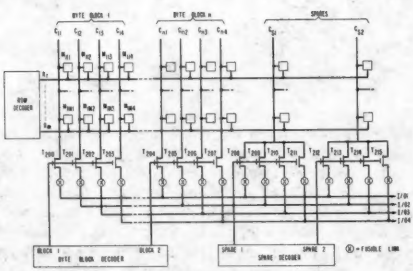
1. A method for simultaneously writing and reading data associated with the same bit positions of a binary storage memory comprising comparing simultaneously timed write and read addresses for data to be written to and read from the memory to determine when there is a comparison identity between the simultaneously timed write and read addresses, and in response to the comparison identity inhibiting the normal read operation while at the same time supplying the write data signals as read output data signals.

4,599,709

BYTE ORGANIZED STATIC MEMORY

Donald G. Clemons, Northampton, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 17, 1984, Ser. No. 581,289
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—200 **6 Claims**



1. An integrated circuit comprising an array of static memory cells arranged in rows and columns;

means for providing access to a plural number of memory cells in said array by simultaneously selecting a number of columns equal to said plural number;

and means for coupling the selected columns to an equal number of input/output terminals of said integrated circuit,

characterized in that

said means for providing access is adapted to select columns that are adjacent to one another in a block of columns in said

array, wherein said array comprises at least two blocks of columns, and the number of columns in each of the said blocks equals said plural number.

4,599,710

INTEGRATED MEMORY CIRCUIT OF A SERIES-PARALLEL-SERIES TYPE

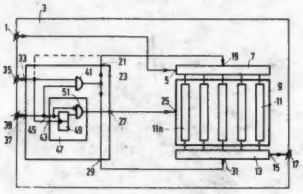
Marcellinus J. M. Pelgrom; Johannes G. Raven; Jan W. Slotboom; Hendrik A. Harwig, and Marcellinus J. J. C. Annegarn, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 1, 1984, Ser. No. 605,958

Claims priority, application Netherlands, May 6, 1983, 8301603

Int. Cl.[4] Q11C *11/40*

U.S. Cl. 365—238 **6 Claims**



1. An integrated memory circuit of a series-parallel-series type comprising a write register, a transfer circuit having a plurality of transfer registers which are operative in parallel in the operating state, and a read register, the write register being controllable by a write clock signal of a write clock signal frequency, the transfer circuit by a transfer clock signal of a transfer clock signal frequency and the read register by a read clock signal of a read clock signal frequency, characterized in that the memory circuit further comprises a clock signal processing circuit having a first input for a signal of the write or read clock signal frequency coupled to a first clock signal input of the memory circuit and a second input for a signal of the transfer clock signal frequency coupled to a second clock signal input of the memory circuit, a first output for the write clock signal, a second output for the transfer clock signal and a third output for the read clock signal, the clock signal processing circuit deriving only from the signals at the first and second inputs the write, transfer and read clock signals.

4,599,711

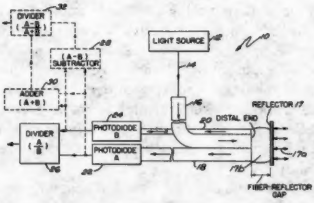
MULTI-LEVER MINIATURE FIBER OPTIC TRANSDUCER

Frank W. Cuomo, East Providence, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 29, 1984, Ser. No. 665,464

Int. Cl.[4] H04R *23/00*; G01L *7/08*

U.S. Cl. 367—141 **5 Claims**



1. A multi-lever hydrophone system, for receiving acoustic signals from a remote sound source, comprising:

a light source, for providing a light beam;

a transmit optical fiber having a first preselected cross sectional area and numerical aperture, the proximal end of said fiber being attached to said light source, for transmitting said light beam therethrough to the distal end thereof, said light beam then exiting therefrom;

miniature reflector means, positioned a preselected distance from and aligned parallel to the end plane of said transmit fiber distal end so as to form a fiber-reflector gap therebetween, for providing an axially responsive reflective surface upon which the light beam exiting said transmit fiber distal end may impinge, said reflector means moveably responding to said acoustic signals in proportion thereto;

a bead of optically clear potting material, filling the gap between said reflector means and said transmit fiber end plane, for moveably bonding said reflector means to said transmit fiber such that the light beam exiting from said transmit fiber propagates in a conically expanding manner therethrough to said reflector means, reflects therefrom, and further expands conically while propagating back through said potting material to said transmit fiber end plane, the reflected circular illuminated area being greater than that of the transmit fiber;

at least one receive optical fiber pair further comprising a first receiving fiber having a second preselected cross sectional area and numerical aperture and a second receive fiber having a third cross sectional area and numerical aperture, said receive fiber pair being juxtaposed alongside said transmit fiber distal end such that the transmit fiber and the receive fiber pair distal ends are aligned to form a common end plane, said at least one receive fiber pair distal ends also being moveably bonded to said bead of optically clear potting material, for receiving said reflected circular illuminated area of said light beam from said reflector means, the areal portion of said circular illuminated area which impinges on said first receive fiber being designated area 'A' and the areal portion of said circular illuminated area which impinges on said second receive fiber being designated area 'B', and transmitting light energy proportional to said illuminated areas A and B;

a first photodetector means, attached to the proximal end of said first receive fiber, for receiving the light energy transmitted therethrough and converting said transmitted light energy to a proportional electrical signal A;

a second photodetector means, attached to the proximal end of said second receive fiber, for receiving the light energy transmitted therethrough and converting said transmitted light energy to a proportional electrical signal B; and

signal processing means, attached to said first and second photodetector means, for receiving said A and B electrical signals therefrom and outputing a combined electrical signal modulated in proportion to said acoustic signals from said sound source, said signal processing means further comprising a first output generating means, attached to said first and second photodetector means, for receiving said A and B electrical signals and producing a signal representing the ratio A/B therefrom, and a second output generating means, attached to said first and second photodetector means, for receiving said A and B electrical signals and producing a signal representing the ratio $A-B/A+B$ therefrom.

4,599,712

MODULAR AIRGUN ARRAY METHOD, APPARATUS AND SYSTEM

Stephen V. Chelminski, West Redding, Conn., assignor to Bolt Technology Corporation, Norwalk, Conn.

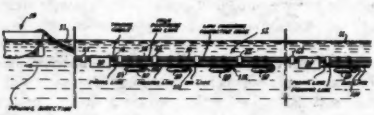
Filed Mar. 15, 1983, Ser. No. 475,542

Int. Cl.[4] H04R *1/02*; G01V *1/06*

U.S. Cl. 367—144 **18 Claims**

1. The method of simultaneously employing a plurality of marine seismic survey airguns in a towed array for generating seismic impulses in a body of water in which the airguns are modularly interconnected comprising the steps of:

using a plurality of submergible water-tight containers having accessible interiors,
providing disconnectible electrical terminal connections within the accessible interior of each container,
providing a high-pressure air by-pass for each container,
interconnecting each by-pass with the next preceding by-pass in the towed array by a disconnectible section of high-pressure hose line,
providing an input connection and an output connection on each container for low-pressure air,
interconnecting the input connection of each container with the output connection of the next preceding container in the array by a disconnectible section of hose sheath,
extending insulated electrical conductors from the terminal connections in one container through the hose sheath section to the terminal connections in the next preceding container in the array,
associating each airgun in the array with a predetermined container in the array,



connecting the solenoid-controlled valve of each airgun to terminal connections in the associated container,
supplying each airgun with high pressure air from the associated by-pass,
feeding high pressure air through the high-pressure hose sections and the by-passes in the array for supplying all of the airguns with high-pressure air, and
feeding low-pressure air through the hose sheath sections in the submerged towed array at a first low-pressure level exceeding ambient water pressure for enveloping the conductors in all such hose sheath sections with protective air at such pressure exceeding ambient water pressure and for filling all of the containers with protective air at such pressure exceeding ambient water pressure for preventing the entry of ambient water in the event of a leak in any submerged hose sheath section or in any submerged container.

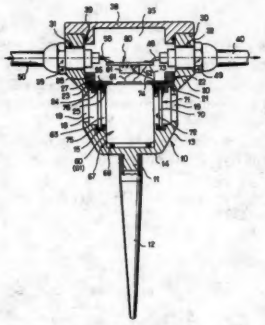
4,599,713

SEISMIC DETECTOR

Jean A. Rudaz, Noisy sur Ecole, France, assignor to Compagnie General de Geophysique, Massy, France

Filed Mar. 9, 1984, Ser. No. 587,903
Claims priority, application France, Mar. 30, 1983, 83 05232
Int. Cl.[4] G01V *1/16;* **H04R** *15/00, 11/00*
U.S. Cl. 367—178 **10 Claims**

1. A seismic detector, comprising:
a casing having a hollow upper part and a hollow lower part;
a spike connected to said lower part;
a geophone mounted in said lower part in a position surmounting the connection for said spike;
at least one passage formed in said upper part through which electrical connections extend to the outside of said housing casing;
perforations formed in said lower part to form a grating through said lower part; and
a hydrophone transducer comprising a generally cylindrical ceramic member having metalized faces, said hydrophone transducer being disposed inside said lower part in opposing relation to said perforation and in a position surrounding said geophone, said hydrophone transducer being water-tightly sealed against said casing so as to seal said hollow lower part against ingress of water and such that an outside face of said hydrophone transducer is subjected through said perforations to ambient hydrostatic pressure



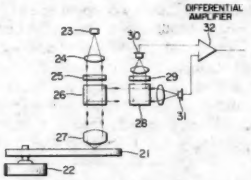
while an inside surface of said hydrophone transducer is subjected to pressure inside said casing which contains said geophone.

4,599,714

PHOTO-MAGNETIC REPRODUCING APPARATUS

Kiyonobu Endo, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 16, 1983, Ser. No. 494,869
Claims priority, application Japan, May 21, 1982, 57-86330
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—13 **3 Claims**



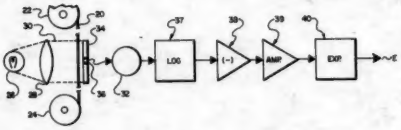
1. A photo-magnetic information reproducing apparatus comprising:
means for causing a light beam polarized in a predetermined direction to be incident on a recording medium on which information is magnetically recorded;
an analyzer;
first detecting means positioned for receiving a part of the light beam transmitted from the recording medium through said analyzer, the polarized condition of the light beam being modulated according to the information recorded on the recording medium, said first detecting means further photoelectrically converting said part of the light beam to obtain a first detected signal;
second detecting means positioned for receiving the remaining part of the light beam transmitted from the recording medium without passing through said analyzer, said second detecting means photoelectrically converting said remaining part of the light beam to obtain a second detected signal; and
means for differentiating said first and second detected signals obtained by said first and second detecting means respectively thereby to obtain an information reproducing signal representing said information recorded on the recording medium.

4,599,715

METHOD AND APPARATUS FOR SOUND TRACK REPRODUCTION

Terry D. Beard, 1407 North View Dr., Westlake Village, Calif. 91361

Filed Jul. 13, 1984, Ser. No. 630,444
Int. Cl.[4] G11B 7/00
U.S. Cl. 369—124 15 Claims



1. Apparatus for producing, from light transmitted through a variable density optical sound track formed on a film, an output electrical signal which directly corresponds to the sound signal recorded on the sound track, in which the amount of light transmitted through the sound track is related to its exposure by a predetermined relationship, comprising:

means for transducing light transmitted through the sound track to an electrical signal having a magnitude which varies in accordance with the amount of transmitted light, and

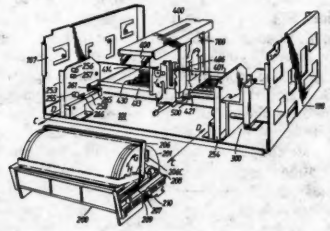
means for operating on said electrical signal by a function which is substantially the inverse of said predetermined relationship to produce an output signal which directly corresponds to the exposure of the sound track.

4,599,716

AUTOCHANGER TYPE DISC PLAYER

Takao Shimbo, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Dec. 26, 1984, Ser. No. 686,374
Claims priority, application Japan, Dec. 27, 1983, 58-244461
Int. Cl.[4] G11B 17/04, 17/22
U.S. Cl. 369—36 2 Claims



1. An autochanger type disc player for selectively playing a disc stored therein, said disc player comprising:

disc playback means;

disc storage means for holding a plurality of discs upright and parallel to each other therein and for allowing said discs to go into or out of said disc storage means, said disc storage means including a plurality of disc holding grooves and partition walls dividing said disc holding grooves from each other, the bottom of each of said disc holding grooves being curved in an arc of a radius approximately equal to the radius of the periphery of said discs and the upper edges of said partition walls being more inclined toward the direction of movement of said discs into said disc holding grooves than an imaginary line tangent with the periphery of one of said discs at any point where said periphery intersects said upper edges, said discs going into said disc holding grooves smoothly without the peripheries of said discs running against said upper edges; and

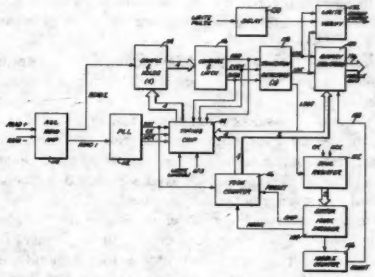
disc transferring means for transferring said discs between said disc playback means and said disc storage means.

4,599,717

DIRECT READ AFTER WRITE VERIFY USING DIFFERENTIAL DETECTION

Rodger R. Bracht, and Johannes J. Verboom, both of Colorado Springs, Colo., assignors to Optical Storage International - U.S., New York, N.Y.

Filed Feb. 8, 1984, Ser. No. 578,148
Int. Cl.[4] G11B 7/00
U.S. Cl. 369—54 15 Claims



1. Apparatus for verifying the correct writing of data on an optical recording surface using differential decoding of fixed-block encoded data comprising signals read from the apparatus upon which data is recorded immediately after writing, comprising

TOON counter means for counting the symbol positions within a symbol, including means for initializing said TOON counter after reaching the count of the last symbol position of the symbol;

an even pair of sample and hold cells responsive to read signals from an apparatus reading data from a medium having data recorded thereon in a fixed-block format;

an odd pair of sample and hold cells responsive to said read signals from an said apparatus reading data from said medium having data recorded thereon in a fixed-block format;

means responsive to said TOON counter means for initializing a first sample and hold cell of both said even and said odd pairs of sample and hold cells every symbol prior to the occurrence of the first symbol position in which holes may be written;

means responsive to said TOON counter means for triggering a second of said even pair of sample and hold cells at the first even symbol position of a symbol;

even comparator means for comparing the first even sample and hold cell value with the second even sample and hold cell value and for generating an even comparator output indicative of the results of the comparison;

means responsive to said TOON counter means and to said even comparator means for retaining the value in the even sample and hold cell having the higher value and for triggering the other even sample and hold cell at the next even symbol position and for repeating said retention and said triggering of the other even sample and hold cell at the occurrence of every even symbol position for which the fixed-block code may contain holes;

means responsive to said TOON counter means for triggering a second of said odd pair of sample and hold cells at the first odd symbol position of a symbol;

odd comparator means for comparing the first odd sample and hold cell value with the second odd sample and hold cell

value and for generating an odd comparator output indicative of the results of the comparison;

means responsive to said TOON counter means and to said odd comparator means for retaining the value in the odd sample and hold cell having the higher value and for triggering the other odd sample and hold cell at the next odd symbol position and for repeating said retention and said triggering of the other odd sample and hold cell at the occurrence of every odd symbol position for which the fixed-block code may contain data;

means responsive to a write pulse for generating a first delayed signal indicative of the write pulse, the length of delay being a predetermined time;

means responsive to said first delayed signal for terminating the triggering of the even or odd sample and hold cell currently being triggered by any of said means responsive to said TOON counter for triggering an odd or an even sample and hold cell;

means responsive to said first delayed signal for generating a second delayed signal, the second delay being a predetermined time;

means responsive to said second delayed signal and to a change in state of said even comparator output for generating a correct even write signal in response to the simultaneous occurrence of said second delayed signal and a change in state of said even comparator output;

means responsive to said second delayed signal and to a change in state of said odd comparator output for generating a correct odd write signal in response to the simultaneous occurrence of said second delayed signal and a change in state of said odd comparator output;

means for initializing an error register to a correct write state;

means responsive to the absence of occurrence of either of said even and said odd correct write signals at the end of a symbol for changing the state of said error register to an incorrect write state.

4,599,718

METHOD FOR ERASING A LIGHT RECORDING MEDIUM

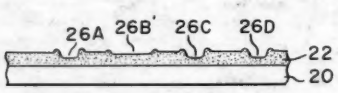
Shiro Nakagawa; Akihiko Kuroiwa, and Kenryo Nanba, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 361,378, Mar. 24, 1982, abandoned. This application Mar. 8, 1985, Ser. No. 708,385

Claims priority, application Japan, Apr. 7, 1981, 56-51160; Sep. 27, 1981, 56-152713; Sep. 27, 1981, 56-152714

Int. Cl.[4] G11B *7/24*

U.S. Cl. 369—100 **2 Claims**



1. A method for erasing information recorded on a light recording medium comprising a substrate and a recording layer formed on the substrate wherein the recording layer is composed essentially of a thermoplastic resin having a number average molecular weight of 30,000 or less and a light adsorbing dye or pigment, which method comprises refilling a recording pit in the recording layer by irradiating and heating a region of the recording layer covering the pit and its vicinity with a laser or LED beam having a diameter greater than the diameter of the pit.

4,599,719

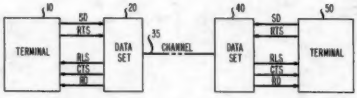
FULL DUPLEX DATA SET WITH HALF-DUPLEX EMULATION

Robert N. Breen, Lanoka Harbor; Robert A. Day, II, Middletown; Victor B. Lawrence, Holmdel, and Michael R. Zboray, East Brunswick, all of N.J., assignors to AT&T Information Systems Inc., Holmdel, N.J.

Filed Jun. 18, 1984, Ser. No. 621,517

Int. Cl.[4] H04L *5/14*

U.S. Cl. 370—24 **2 Claims**



1. A full-duplex data set adapted for use in conjunction with an associated first half-duplex data terminal, said data set being adapted to communicate to a second data set over an outgoing communication channel and to receive communications from said second full-duplex data set from an incoming communication channel, said second data set being adapted for use in conjunction with an associated second half-duplex data terminal, each of said terminals having a request-to-send lead which is activated by said each terminal when data is desired to be passed from said each terminal to the associated data set, and at least said first terminal further having a receive line signal lead and being adapted to activate its request-to-send lead only if its receive line signal lead is deactivated, said data set comprising

means for receiving near-end data from said first terminal,

means for modulating said near-end data signal onto a first continuous carrier signal and for applying the resulting modulated signal to said outgoing channel,

means for receiving from said incoming channel a second continuous carrier signal modulated with far-end data and for recovering said far-end data from said second carrier signal,

means for activating said receive line signal lead in response to a first predetermined signal indication in said received carrier signal and for deactivating said receive line signal lead in response to a second predetermined signal indication in said received carrier signal, said first signal indication being generated by said second data set in response to activation by said second terminal of its request-to-send lead and said second signal indication being generated by said second data set in response to deactivation by said second terminal of its request-to-send lead, and

means for applying to said first terminal the recovered far-end data that is intermediate said first and second signal indications.

4,599,720

SATELLITE COMMUNICATIONS SYSTEM

Charles A. Kunzinger, Morrisville, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 6, 1982, Ser. No. 395,200

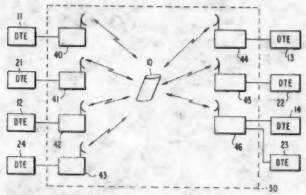
Int. Cl.[4] H04J *3/06*

U.S. Cl. 370—104 **6 Claims**

1. In a communication system of the type wherein data processing machines in each of one or more user networks communicate through a TDMA common carrier including a satellite in earth orbit with at least one transponder and a plurality of geographically spaced earth station means, each for communicating with other of the earth station means in a TDMA format through the transponder, the improvement comprising:

means for transferring TDMA frame timing signals from the common carrier to each of the user networks, said transferring means including, at each earth station, time base means responsive to TDMA frame timing signals for generating a

pulse defining allocated capacity of a particular one of said user networks; and



adapter means in each user network for synchronizing information transfer through the network in accordance with received TDMA frame timing signals.

4,599,721

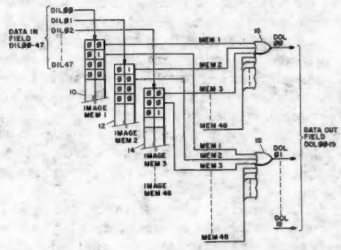
PROGRAMMABLE CROSS BAR MULTIPLEXER

Donald F. Murray, St. Helens, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 2, 1984, Ser. No. 596,209

Int. Cl.[4] H04J *3/04;* **G11C** *8/02;* **H03K** *17/00, 17/40*

U.S. Cl. 370—112 **9 Claims**



1. A programmable multiplexer comprising:

a plurality of input terminals for receiving address inputs,

a plurality of output terminals,

a memory system including an array of addressable memory units each receiving a portion of said address inputs from a different series of said input terminals and each memory unit storing, for retrieval, numbers representing the combinations of output terminal activation corresponding to combinations of input terminal activation from the series of input terminals applied to that memory unit,

and means for ORing corresponding accessed outputs of like numerical significance of said addressable memory units as represent different series of input terminals to provide outputs for said array at said output terminals.

4,599,722

APPARATUS FOR ENCODING AND DECODING DIGITAL DATA TO PERMIT ERROR CORRECTION

Brian C. Mortimer, Ottawa, Canada, assignor to Canadian Patents and Development Limited-Société Canadienne des Brevets et D'Exploitation Limitée, Ottawa, Canada

Filed Apr. 3, 1984, Ser. No. 596,397

Int. Cl.[4] G06F *11/10*

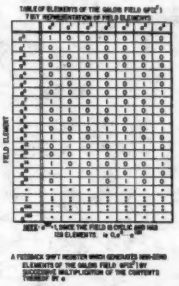
U.S. Cl. 371—37 **30 Claims**

1. A single bit error correction encoding apparatus for producing an error correction packet for transmission in a data block, said error correction packet having M bits, one of which M bits is a parity check bit, wherein,

(i) said data block consists of said error correction packet and (L−1) data packets, each of said data packets having M bits and the same predetermined parity, one of said M bits of each of said (L−1) data packets being a parity check bit, whereby both "L" and "M" are positive integers;

(ii) the symbol C_i represents the binary value of the ith bit in said data block such that the bit sequence (C_0, C_1, C_2, . . . C_N) represents the binary values of the sequence of bits in a data block of length (N+1) bits, whereby N+1+ML, "N" being a positive integer and "i" being an integer greater than or equal to 0 and less than or equal to N;

(iii) the bit sequence (C_{jM}, C_{jM+1}, C_{jM+2}, . . . $C_{jM+(M-1)}$) represents the values of each of the M bits of said error



correction packet being the (j+1)st packet of said data block, whereby j is a positive integer greater than or equal to 0 and less than or equal to (L−1); and,

(iv) the symbol α represents a primitive element of a Galois Field GF(2^{M-1}),α being a root of a primitive polynomial Q(X) of degree (M−1), and where the arithmetic operation addition is performed according to modulo 2 arithmetic;

said encoding apparatus comprising:

(a) evaluation means for evaluating the sum T having an expansion as a pattern of (M−1) bits, whereby

$$T = \sum_{i=0}^{jM-1} C_i\alpha^i + \sum_{i=jM+M}^{N} C_i\alpha^i,$$

if j is not equal to 0 or (L−1) or,

$$T = \sum_{i=M}^{N} C_i\alpha^i,$$

if j is equal to 0, or,

$$T = \sum_{i=0}^{(L-1)M-1} C_i\alpha^i,$$

if j is equal to L−1; and,

(b) selection means for selecting said error correction packet such that:

(i) said selection means produces a sequence of bits (C_{jM}, C_{jM+1}, . . . $C_{jM+(M-1)}$) satisfying the relationship expressed as:

$$\sum_{i=jM}^{jM+(M-1)} C_i\alpha^i = T,$$

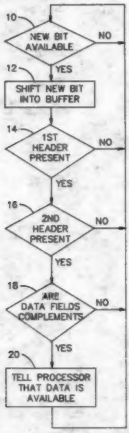
whereby T is the sum of said evaluation means; and,

(ii) said sequence of bits (C_{jM}, C_{jM+1}, . . . $C_{jM+(M-)}$) has the same predetermined parity as that of each of said data packets of said data block.

4,599,723
METHOD OF ENCODING DATA FOR SERIAL TRANSMISSION

Henry H. Eck, Catonsville, Md., assignor to Pulse Electronics, Inc., Rockville, Md.

Filed Feb. 14, 1984, Ser. No. 580,172
Int. Cl.[4] H04L 7/00
U.S. Cl. 371—47 16 Claims



1. A method of encoding data for serial transmission or recording comprising the steps of

accepting a data string composed of binary "1's" and "0's" for transmission or recording,

complementing said data string,

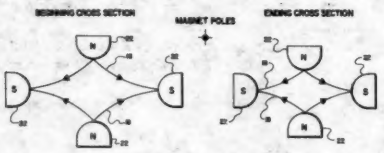
providing each of said data string and its complement with a header, wherein at least one bit is the same in corresponding bit positions of the headers, said headers being used to identify and synchronize transmitted or recorded data by comparing said corresponding bit positions in the headers, and

framing the data to be transmitted or recorded by ordering said data string with its header and the complement of said data string with its header in series.

4,599,724
QUADRUPOLE-MAGNETIC-PUMP-FIELD FREE ELECTRON LASER

Wayne A. McMullin, Chatworth, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 13, 1984, Ser. No. 670,237
Int. Cl.[4] H01S 3/00
U.S. Cl. 372—2 7 Claims



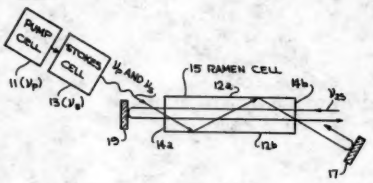
1. A free electron laser including magnetic means forming an interaction region where spontaneous emission from the electron beam is passed through an oscillator resulting in a coherently amplified output and wherein:

said magnetic means comprises a quadrupole magnet.

4,599,725
RAMAN LASER WITH CONTROLLABLE SUPPRESSION OF PARASITICS

E. Victor George, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 8, 1983, Ser. No. 473,178
Int. Cl.[4] H01S 3/00
U.S. Cl. 372—3 5 Claims



4. Apparatus for producing a high intensity Raman laser pulse, the apparatus comprising:

a Raman accumulator having first and second parallel side walls, which are substantially fully reflective at two predetermined, adjacent frequencies ν_p and ν_s ($\lesssim\nu_p$), and having first and second opposing end walls that are substantially transparent at frequencies ν_p and ν_s and at a third predetermined adjacent frequency ν_{2s} ($\lesssim\nu_s$) and containing a Raman-active gas with an amplifier gain/loss curve that manifests gain at frequency ν_p and at frequency ν_s, where ν_s is the first Stokes wave frequency corresponding to a pump frequency of ν_p for the Raman-active gas, with the gas manifesting substantial loss at the frequency ν_{2s} ($\lesssim\nu_s$), which is the second Stokes wave frequency corresponding to a pump frequency ν_p for the Raman-active medium;

a pump cell, spaced apart from the accumulator and containing a medium capable of producing a highly directional, substantially monochromatic radiation pulse of frequency ν_p and positioned to direct such radiation through the first accumulator transparent end wall so that such radiation reflects at least once from the first highly reflective side wall of the accumulator and exits from the accumulator through the second transparent end wall of the accumulator;

a first mirror, positioned adjacent to the accumulator and substantially fully reflecting at frequencies ν_p and ν_s, positioned adjacent to the accumulator to reflect the radiation pulse that issues from the accumulator through the second end wall back into and through the accumulator along substantially the same optical path that the pulse travelled on its first passage through the accumulator;

a Stokes cell, adjacent to the pump cell and spaced apart from the accumulator and containing a medium capable of producing a highly directional, substantially monochromatic radiation pulse of frequency ν_s and positioned to direct such radiation through the accumulator along substantially the same optical path as that followed by the pump pulse;

radiation source means, spaced apart from the accumulator, for producing a highly directional, substantially monochromatic radiation pulse of frequency ν_{2s}, positioned to direct the pulse through the accumulator from one accumulator transparent end wall to the other transparent end wall in timed relationship with and in direction generally opposite to first passage of the first Stokes wave pulse through the accumulator; and

a second mirror that is substantially fully reflecting for radiation at frequency ν_{2s}, positioned adjacent to an accumulator end wall so as to reflect the second Stokes wave pulse after the pulse has passed through the accumulator once and to return the pulse through the accumulator a second

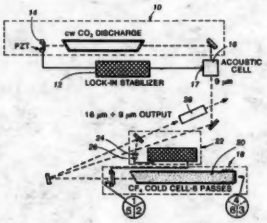
time in timed simultaneous relationship with passage of the first Stokes wave pulse through the accumulator a second time.

4,599,726

APPARATUS AND METHOD FOR GENERATING CONTINUOUS WAVE 16 μM LASER RADIATION USING GASEOUS CF_4

John M. Telle, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 1, 1984, Ser. No. 606,039
Int. Cl.[4] H01S 3/30
U.S. Cl. 372—4 12 Claims



1. An apparatus for generating cw 16 μm laser radiation in gaseous CF_4, which comprises in combination;

a. a cw pump laser for generating coherent radiation in the 9 μm region of the infrared spectrum, said coherent 9 μm radiation having a wavelength appropriate for interacting with the CF_4 such that a relationship between pump power and CF_4 pressure results in a population inversion in the CF_4 suitable for producing cw laser oscillation therein;

b. means for directing said coherent 9 μm radiation into the region of the CF_4 in order to permit said interaction therewith;

c. means for maintaining the CF_4 gas at temperatures low enough to establish said population inversion suitable for sustaining said laser oscillation; and

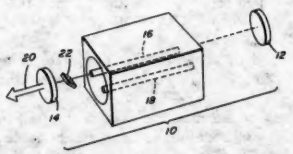
d. means for extracting the 16 μm cw laser radiation resulting from said laser oscillation.

4,599,727

STRONTIUM ALUMINUM FLUORIDE LASER

Hans P. Jenssen, Belmont, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 26, 1984, Ser. No. 665,014
Int. Cl.[4] H01S 3/16
U.S. Cl. 372—41 7 Claims



1. A laser comprising

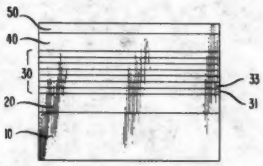
a resonant cavity having a means for outputting coherent radiation and a laser medium comprising a crystal of $SrAlF_5:Cr^{3+}$, and pump means for exciting the laser medium.

4,599,728

MULTI-QUANTUM WELL LASER EMITTING AT 1.5 μM

Kambiz Alavi, North Plainfield; Alfred Y. Cho; Thomas P. Pearsall, both of Summit, and Henryk Temkin, New Providence, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 11, 1983, Ser. No. 512,232
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—45 12 Claims



1. In a semiconductor heterostructure laser structure comprising first and second wide bandgap confining layers; and

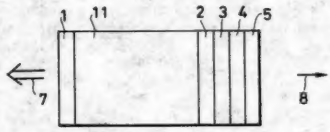
an active region between said first and second wide bandgap confining layers, said active region comprising a plurality of well layers comprising at least one semiconductor selected from the group consisting of GaInAs and GaAsSb interleaved with a plurality of barrier layers, said well layers having a thickness less than 150 Angstroms.

4,599,729

SEMICONDUCTOR LASER DEVICE HAVING FACETS PROVIDED WITH DIELECTRIC LAYERS

Yoshimitsu Sasaki; Takashi Kajimura, both of Nishitama; Naoki Chinone, Hachioji, and Michiharu Nakamura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 9, 1984, Ser. No. 578,530
Claims priority, application Japan, Feb. 9, 1983, 58-18825
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—49 14 Claims



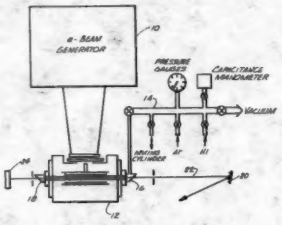
1. A semiconductor laser device of the type which includes at least one laminate of a first dielectric layer and a second dielectric layer on one of two facets of a resonator and in which the refractive index of said first dielectric layer is lower than that of said second dielectric layer, wherein said second dielectric layer consists of an amorphous material containing silicon and hydrogen as its essential elements and the other of said two facets is provided with a coating consisting of a single dielectric layer so as to provide said other of the two facets with a lower refractive index than that of said one of the two facets.

4,599,730

VISIBLE AND ULTRAVIOLET LASERS BASED ON EXCIMER TRANSITIONS IN THE HOMONUCLEAR HALOGENS

James G. Eden, Champaign, and Kevin P. Killeen, Urbana, both of Ill., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 1, 1984, Ser. No. 656,814
Int. Cl.[4] H01S *3/22*
U.S. Cl. 372—57 9 Claims



1. An excimer laser including:

a gas mixture of a halogen-donor modecular gas and an inert gas at room temperature and ambient pressure; and

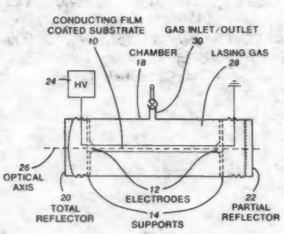
means for exciting said gas mixture to produce a flouresscence emission spectrum having a tunable bandwidth an absorber gas added to said gas mixture to absorb a competing D' to A' emission transition which tends to reduce gain associated with said flourescence emission spectrum.

4,599,731

EXPLODING CONDUCTING FILM LASER PUMPING APPARATUS

Kenneth D. Ware, San Diego, Calif., and Claude R. Jones, Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 27, 1984, Ser. No. 604,686
Int. Cl.[4] H01S *3/091*
U.S. Cl. 372—77 12 Claims



1. An apparatus for generating intense electromagnetic radiation for producing a population inversion in a gaseous medium suitable for laser oscillation and amplification, said apparatus comprising in combination:

a. an elongated electrically insulating substrate onto which is deposited a thin, electrically conducting film, said elongated substrate having a first end and a second end;

b. means for providing a pulsed potential difference between said first end and said second end, whereby sufficient electrical current is passed through said electrically conducting film to cause it to vaporize producing thereby an electical discharge in the gaseous medium, said discharge generating the intense electromagnetic radiation suitable for producing the population inversion suitable for laser oscillation and amplification therein; and

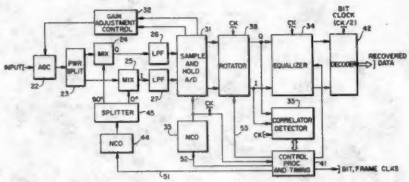
c. means for supporting the laser oscillation arising from the population inversion and for extracting laser radiation produced therefrom, said means having an optical axis.

4,599,732

TECHNIQUE FOR ACQUIRING TIMING AND FREQUENCY SYNCHRONIZATION FOR MODEM UTILIZING KNOWN (NON-DATA) SYMBOLS AS PART OF THEIR NORMAL TRANSMITTED DATA FORMAT

Ronald S. LeFever, Satellite Beach, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Apr. 17, 1984, Ser. No. 601,320
Int. Cl.[4] H04L *25/08*
U.S. Cl. 375—13 58 Claims



1. For use in a communications receiver wherein signals received thereby contain successive data symbols between which are interleaved sequences of prescribed known symbols, the distribution of said interleaved sequences of prescribed known symbols among said data symbols being predetermined, said known symbols being employed in said receiver for providing compensation for distortion-introduced characteristics of a channel over which signals received have been transmitted, a method of operating said receiver to enable said receiver to detect said data symbols comprising the steps of:

(a) selectively combining a replica of said known symbols with received symbol-representative signals so as to identify where, within the received signals, said sequences of prescribed known symbols whose distribution among said data symbols is predetermined are interleaved; and

(b) causing the distortion-introducing characteristics of the channel to be compensated in accordance with the contents of received signals including those whose locations within the received signals correspond to those of the interleaved prescribed known symbols indentified in step (a).

4,599,733

MULTILEVEL NOISE CODE MATE PAIR GENERATION AND UTILIZATION OF SUCH CODES

Frank S. Gutleber, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 19, 1983, Ser. No. 533,183
Int. Cl.[4] H04B *14/04*
U.S. Cl. 375—25 18 Claims

1. A method of generating a code mate pair of multibit digital codes of at least two code bits each, comprising the steps of:

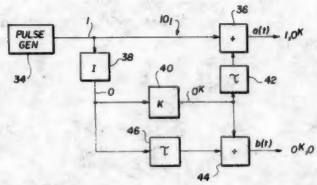
generating four separate code bits each of a first or second polarity, said code bits comprising the same first amplitude and occuring in undelayed or mutual time coincidence;

selectively amplifying two of said four code bits by a predetermined signal gain having a real number amplitude multiplying factor other than one to provide two amplified code bits;

selectively delaying at least two of said code bits each by a

time delay at least equal to the code bit width of the other code bit to provide two delayed code bits; and

thereafter selectively combining said four code bits into a first code mate including an undelayed code bit and a delayed code bit and wherein one code bit is comprised of



an amplified code bit and the other code bit comprises a said first amplitude code bit, and a second code mate including an undelayed code bit and a delayed code bit and wherein one code bit is comprised of an amplified code bit and the other code bit comprises a first amplitude code bit.

4,599,734

SPACE DIVERSITY COMMUNICATIONS SYSTEM FOR MULTI-DIRECTION TIME DIVISION MULTIPLEX COMMUNICATIONS

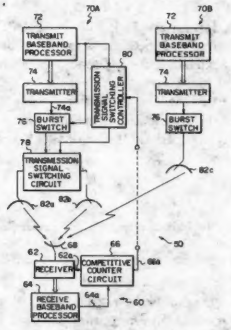
Kazuhiro Yamamoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 5, 1985, Ser. No. 720,090

Claims priority, application Japan, Apr. 10, 1984, 59-72364

Int. Cl.[4] H04B 7/06

U.S. Cl. 375—40 **6 Claims**



1. A space diversity communications system for a time division multiplex communications network having one central station and a plurality of satellite stations, each of the satellite stations comprising a transmitter for transmitting a burst signal to the central station within a time slot assigned to the satellite station, the central station comprising a receiver for time-sequentially receiving the burst signals from the respective satellite stations,

(a) said transmitter at any of the satellite stations which needs diversity communications comprising:

two antennas;

one transmitter unit for applying the burst signal selectively to said two antennas; and

transmission signal switching means for causing said transmission unit to select one of the two antennas which is to receive the burst signal, in response to a control signal which is applied from the central station and within a time slot other than those during which burst signals assigned to the satellite station are to be transmitted to the central station,

(b) said receiver at the central station comprising:

demodulator means for demodulating the received burst signal; and

error pulse generator means for generating error pulses by detecting a bit error rate of the demodulated burst signal for each of the satellite stations which needs the diversity communications,

(c) the central station further comprising:

control signal generator means for generating the control signal in response to the error pulses; and

signal transfer means for transferring the generated control signal to any of the satellite stations which is associated with the detected error pulses.

4,599,735

TIMING RECOVERY CIRCUIT FOR SYNCHRONOUS DATA TRANSMISSION USING COMBINATION OF L BI PHASE AND MODIFIED BIPHASE CODES

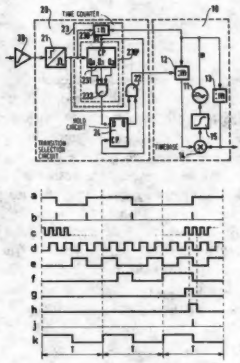
Serge Surie, L'Hay Les Roses, and Francois Marcel, Orsay, both of France, assignors to Compagnie Industrielle des Telecommunication Cit-Alcatel, Paris, France

Filed Mar. 9, 1984, Ser. No. 587,778

Claims priority, application France, Mar. 11, 1983, 83 04038; Dec. 1, 1983, 83 19211

Int. Cl.[4] H04L 7/02, 27/18

U.S. Cl. 375—54 **5 Claims**



1. Timing recovery circuit for synchronous data transmission using a signal which, in the baseband, is formed by a succession of two-level signal elements, without overlap, isochronous and of duration T, able to take one of the four forms defined by the functions:

$$\pm\text{sign}\left(\sin\frac{2\pi t}{T}\right);\ \pm\text{sign}\left(\cos\frac{2\pi t}{T}\right)$$

said circuit comprising a transition selection circuit adapted to select transitions in the received signal, in the baseband, separated from those which immediately precede them by a time-delay situated in an arbitrary range, bracketing a symbol duration of between $\frac{3}{4}$ and 5/4 times, exclusive, the duration of a signal element, and a timebase which is synchronised on the transitions selected by said selection circuit and which delivers the signal element recovered timing, wherein said transition selection circuit comprises:

a transition detector for generating a short duration pulse in response to each transition of the received signal in the base band,

a gate for sorting the pulses from said transition detector, said gate being inserted between the output of said transition detector and a synchronisation input of said timebase,

a first counting circuit reset to zero by the pulses generated by said transition detector and incremented by a first clock signal defining elementary time intervals which are very short relative to the duration of a signal element but longer than the duration of the pulses from said transition detector, said first counting circuit delivering a second clock signal defining elementary time intervals which are short relative to the duration of a signal element,

a second counting circuit reset to zero by pulses generated by said first transition detector and incremented by the second clock signal from said first counting circuit, said second counting circuit delivering an overshoot signal when its count value is going to overshoot said given duration measured by means of pulses of said second clock signal, and

a hold circuit formed by a D-type bistable having a D input receiving said overshoot signal from said second counting circuit and a clock input receiving said second clock signal from said first counting circuit, an output of said bistable controlling said gate.

3. Timing recovery circuit for synchronous data transmission using a signal which, in the baseband, is formed by a succession of two-level signal elements, without overlap, isochronous and of duration T, able to take one of the four forms defined by the functions:

$$\pm\text{sign}\left(\sin\frac{2\pi t}{T}\right)\ ;\ \pm\text{sign}\left(\cos\frac{2\pi t}{T}\right)$$

said circuit comprising a transition selection circuit adapted to select transitions in the received signal, in the baseband, separated from those which immediately precede them by a timedelay situated in an arbitrary range, bracketing a symbol duration of between $\frac{3}{4}$ and 5/4 times, exclusive, the duration of a signal element, said transition selection circuit including a time counter for determining said symbol duration, and a timebase which is synchronised on the transitions selected by said selection circuit and which delivers the signal element recovered timing, said timing recovery circuit further comprising a circuit adapted to disable said transition selection circuit which initializes said time counter of the latter when the instantaneous amplitude of the received signal, in the baseband, crosses the limits of a predetermined range bracketing the average amplitude of said signal.

4,599,736

WIDE BAND CONSTANT DUTY CYCLE PULSE TRAIN PROCESSING CIRCUIT

Karl-Heinz Hoppe, Wallerstädten, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 19, 1984, Ser. No. 632,582

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1983, 3329808

Int. Cl.⁴ H04L *7/02, 27/10*

U.S. Cl. 375—110 **4 Claims**

1. A pulse train processing circuit to generate, from an input pulse train of variable pulse repetition frequency, an output pulse train with a constant, predetermined duty cycle, comprising, in accordance with the invention,

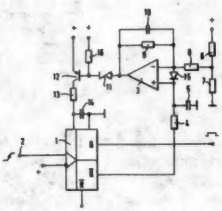
a wave-shaping circuit (1) having a data input (2, 22), generating square-wave pulses of a length or duration (d) and having a control input (13, 14) determining the pulse length (d) of the square-wave pulses at an output thereof;

a decoding circuit (29) connected to the output of said wave-shaping circuit (1) for recognition, in a signal train encoded in bi-phase mark code wherein bit cell boundaries are denoted by a phase alternation, and isolation of an additional phase alternation in the middle of a bit cell indicating that said bit cell represents a logical "1";

a recognition circuit (34) connected to the output of the decoding circuit (29) for isolating any multiple additional phase alternations within a period of time recognized as a basic clock period;

a low-pass filter (4, 5) connected to receive the square-wave pulses from said wave-shaping circuit (1);

a source of controllable voltage (6, 7) supplying a comparison or command voltage;



a differential amplifier (3) receiving, as one input, the output of the low-pass filter (4, 5) and, as another input, the comparison or command voltage of the controllable voltage source;

a transistor circuit (35) connected to the output of said recognition circuit (34) and acting upon said differential amplifer (3) so as to shorten said pulse duration (d); and

a controlled current source (12) connected to and controlled by the output from the differential amplifier (3) and supplying a controlled current to the control input (13, 14) of the wave-shaping circuit (1).

4,599,737

X-RAY MASK WITH Ni PATTERN

Takeshi Kimura, Higashimurayama; Hidehito Obayashi, Nerima, and Kozo Mochiji, Tachikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 6, 1983, Ser. No. 529,710

Claims priority, application Japan, Sep. 16, 1982, 57-159653

Int. Cl.⁴ G03F *1/00;* **G21K** *5/00*

U.S. Cl. 378—35 **17 Claims**

1. An X-ray mask having a membrane of an X-ray transmitting material formed on an annular support frame, and a mask pattern of an X-ray absorbing material formed on said membrane, wherein said mask pattern consists of at least one layer, said at least one layer including at least a layer formed from a material consisting of nickel, or a material having nickel as a principal component, said at least a layer having a thickness such that said at least a layer acts as said X-ray absorbing material of said mask pattern.

4,599,738

UNIVERSAL MAMMOGRAPHY COMPRESSION SYSTEM

Patrick Panetta, 29 Keswick Dr., East Islip, N.Y. 11730, and Jack Wennet, 20 Spinner La., Commack, N.Y. 11725

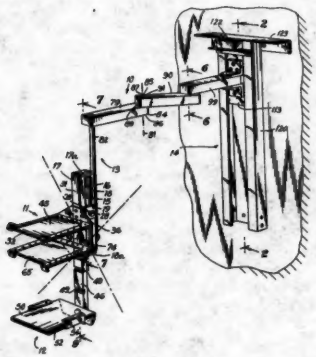
Filed Apr. 17, 1984, Ser. No. 601,279

Int. Cl.⁴ G03B *41/16*

U.S. Cl. 378—037 **15 Claims**

1. A mammography compression system for a patient comprising; breast examination support means having opposed

upper and lower compression plate mounts and compression plates disposed in said mounts, for compressing the breasts of a patient therebetween; said breast examination support means further comprising an X-ray plate mount for mounting an X-ray plate in a plurality of positions relative to said upper compression plate; mounting means connected to said breast support means at an end of the mounting means; attachment means connected to another end of said mounting means for attachment to a fixed support; said mounting means comprising means for retractably and extendably moving said breast support means relative to said fixed support, and means for rotatably moving said breast examination support means; and said compression and X-ray plate mounts being formed so that said X-ray plate is mountable in said lower compression plate mount, whereby said breast examination support means is movable to several examination positions while the patient remains substantially upright, and with the use of said compression plates and said X-ray plate, there is a magnification X-ray and with the upper compression plate and said X-ray plate in the lower compression plate position, there is a non-magnification compression X-ray.

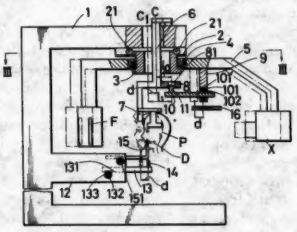


4,599,739

DENTAL RADIOGRAPHIC APPARATUS FOR PHOTOGRAPHING ENTIRE JAWS

Kazuo Nishikawa, and Keisuke Mori, both of Kyoto, Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Jan. 18, 1985, Ser. No. 692,830
Claims priority, application Japan, Jan. 20, 1984, 59-9106
Int. Cl.[4] A61B *6/14*; G03B *42/02*
U.S. Cl. 378—39 **6 Claims**



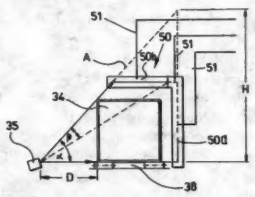
1. A radiographic apparatus for photographing the entire jaws designed to make a tomogram of a curved plane approximate to a dental arch by the locus of center of rotation of the X-ray beam projected from an X-ray source onto an X-ray film holder describing an approximately V-shaped envelope which forms an apex on an approximate medial line and recedes from the apex toward the left and right of the approximate medial line by moving a rotary arm around a patient without interference with the patient, the arm having the X-ray source at one end and the X-ray film holder at the other end thereof, said apparatus being characterized in that it comprises a means for changing straight-line distance on the approximate medial line between the apex and receding point of limit of the envelope and a means for indicating the distance of shift thus changed or a means for automatically moving the indication means a distance equal to the distance of shift.

4,599,740

RADIOGRAPHIC EXAMINATION SYSTEM

Arthur P. Cable, 181 Sumatra Rd., London NW6 1PP, England

Continuation-in-part of Ser. No. 456,111, Jan. 6, 1983, abandoned. This application Sep. 3, 1985, Ser. No. 772,144
Int. Cl.[4] G01N *23/04*
U.S. Cl. 378—57 **11 Claims**



1. A radiographic examination system for examining the contents of container units, in which container units to be examined are positioned between a high energy radiation source and radiation detecting means, said examination system comprising:

a high energy radiation source of X-rays,

a collimator means for producing a substantially parallel sided beam of radiation from said X-rays for transmission through said container unit,

X-ray radiation detector means, said X-ray radiation detector means operating directly or indirectly to produce electrical signals from said transmitted radiation beam of X-rays detected thereby,

said X-ray radiation detector means including first and second linearly extending radiation sensitive means, said first radiation sensitive means lying in a first plane and at a first angle to the axis of said transmitted radiation beam of X-rays and said second radiation sensitive means lying in a second plane at a second angle to said axis of said transmitted radiation beam of X-rays,

a display means at a location remote from said radiation detection means.

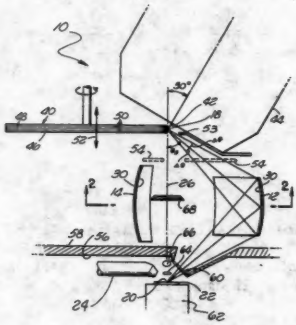
means for transmitting said electrical signals from said X-ray radiation detector means to said display means, said display means incorporating electronic processor means and at least one screen for displaying said information signals from both said first and said second radiation sensitive means as a complete optical image for visual inspection, and

one of photographic recording apparatus and electronic apparatus for recording said information signals displayed on said screen.

4,599,741
SYSTEM FOR LOCAL X-RAY EXCITATION BY MONOCHROMATIC X-RAYS

David B. Wittry, Pasadena, Calif., assignor to USC—Dept. of Materials Science, Los Angeles, Calif.

Filed Nov. 4, 1983, Ser. No. 549,366
Int. Cl.[4] G01M 23/00
U.S. Cl. 378—85 18 Claims

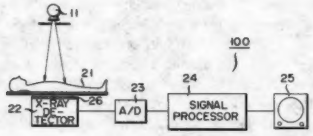


1. A selectable X-ray monochromator comprising:
means for generating X-rays emanating from a preselected source location;
a plurality of diffracting crystal means selectively actuable to respective stationary operative positions relative to said source location and a preselected image location;
each diffracting means comprising toroidal crystal means which, in the operative position of the diffracting means, satisfies Johannson geometric conditions within a plurality of planes containing the source and image locations to substantially monochromatize X-rays emanating from the source location and focus said X-rays onto a sample at the image location; and
the diffracting means having different preselected diffracting properties and being parfocal with each other relative to the source and image locations.

4,599,742
X-RAY DIAGNOSTIC APPARATUS

Katsuya Kikuchi, and Michitaka Honda, both of Tochigi, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 17, 1984, Ser. No. 581,043
Claims priority, application Japan, Feb. 18, 1983, 58-24877
Int. Cl.[4] H04N 7/18
U.S. Cl. 378—099 6 Claims

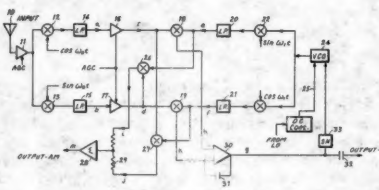


1. An X-ray diagnostic apparatus comprising:
an X-ray radiation source for projecting X-rays toward an object under examination;
X-ray detector means for detecting said X-rays which have passed through said object to derive a total X-ray intensity distribution signal of the object, said signal including a primary X-ray signal component and a scattered X-ray signal component, said scattered X-ray signal component being caused by scattered X-rays;
signal processor means for processing said X-ray intensity distribution signal detected by said X-ray detector means, said signal processor means including;
means for calculating a constant value from the detected X-ray intensity distribution signal based upon a plurality of X-ray exposure parameters,
means for subtracting said constant value from said total X-ray intensity distribution signal to derive a subtraction signal, and
means for filtering said subtraction signal by using a given function defining a spatial spread of the scattered X-rays so as to define a distribution function of said primary X-ray signal component without adverse influences from said scattered X-ray signal component; and
monitor means for displaying a distribution form based upon said distribution function of said primary X-ray signal component.

4,599,743
BASEBAND DEMODULATOR FOR FM AND/OR AM SIGNALS

Joseph Reed, Stamford, Conn., assignor to ITT Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 342,442, Jan. 25, 1982, Pat. No. 4,476,585. This application Oct. 9, 1984, Ser. No. 658,957
Int. Cl.[4] H04B 1/26
U.S. Cl. 455—207 5 Claims



1. In a demodulator for an FM and/or AM received signal, said demodulator being of the type employing a local oscillator for providing quadrature output signals substantially at the center frequency of the received signal, and with first and second mixing means for separately mixing said quadrature output signals with the received signal to provide at their respective outputs resulting signals of a zero-IF with the sidebands folded over and extending in frequency from DC to the single sideband width of the original signal, low pass filter means associated with each output of said first and second mixing means to provide a first and a second low pass filtered signal and having a predetermined highest pass frequency,
the combination therewith of apparatus for operating on said first and second low pass filtered signals to demodulate the received signal, comprising
third and fourth mixing means each having a first input for respectively receiving said first and second low pass filtered signals, and a second input,
a variable controlled oscillator (VCO) having a control input and an output for providing a controlled frequency,
fifth and sixth mixing means each having one input coupled to said output of said VCO, and another input, and an output, with the output of said fifth mixing means being coupled to said second input of said third mixing means, and with the output of said sixth mixing means coupled to said input of said fourth mixing means,
means for supplying mutually quadrature related sinusoidal signals at a frequency independent of the center frequency of the received signal respectively to said other inputs of said fifth and sixth mixing means,
a difference amplifier having one input coupled to the output of said third mixing means and another input coupled to the output of said fourth mixing means for providing a difference signal at its output,
means for coupling the output of said difference amplifier to

said control input of said VCO to cause said output of said difference amplifier to provide a demodulated signal indicative of the modulation on the received signal,

seventh and eighth mixing means each having two inputs and an output, with said inputs of said seventh mixing means being connected to said outputs of said third and fifth mixing means and with said inputs of said eighth mixing means being connected to said outputs of said fourth and sixth mixing means, and

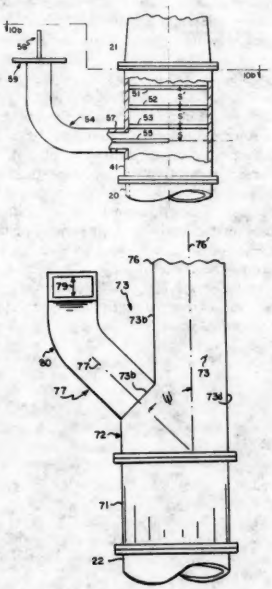
means for summing signals appearing at the outputs of said seventh and eighth mixing means to provide a demodulation of amplitude modulation of the received signal.

4,599,744

UHF BROADCAST ANTENNA ON A TOWER WITH CIRCULAR WAVEGUIDE CARRYING RF ENERGY UP THE TOWER TO THE ANTENNA WITH POLARIZATION ADJUSTMENTS AND EXCLUSIONS

Thomas J. Vaughan, Rye Beach, N.H., assignor to Micro Communications, Inc., Manchester, N.H.

Filed Nov. 10, 1983, Ser. No. 550,410
Int. Cl.[4] H04B 1/04; H01P 1/162
U.S. Cl. 455—129 **10 Claims**



7. In a high power antenna for UHF TV frequency broadcast including a radiating antenna located at the top of a tower, a transmitter located at the bottom of said tower, a substantial length of circular waveguide transmission line for conducting UHF power from the transmitter to the antenna supported by the tower, the improvement comprising,

(a) a polarization filter shunt including a shunt transmission line attached to said circular waveguide for conducting undesired waves therefrom to a load wherein said polarization filter shunt includes,

(b) short circuit conductors inside said circular waveguide contacting opposite walls thereof, said conductors being arranged parallel to each other and perpendicular to the direction of polarization of said desired waves; and

(c) said shunt transmission line connects to the outside wall of said circular waveguide with an opening through said wall for coupling fields of said undesired waves to a fundamental mode of propagation in said shunt

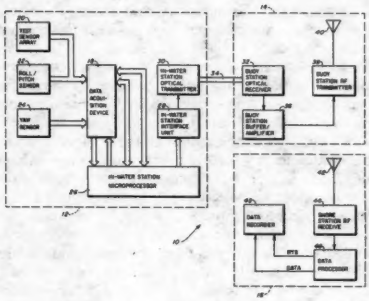
(d) whereby said undesired waves produced in said circular waveguide due to coupling between waves of the same propagation mode, but different polarization directions flow to said shunt transmission line and said desired waves polarized in a desired direction flow from said circular waveguide to said antenna at the top of said tower.

4,599,745

HYBRID FIBER OPTICS AND RADIO FREQUENCY TELEMETRY APPARATUS FOR ACQUIRING DATA FROM AN UNDERWATER ENVIRONMENT

Robert H. Baran, Bethesda; Armand Cioccio, deceased, late of Silver Spring, both of Md. (by Mary Jane Cioccio, personal representative); Joseph G. Komenda, Detroit, Mich., and Ronald B. Hawkins, San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 21, 1984, Ser. No. 612,484
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—612 **4 Claims**



1. A hybrid fiber optics and radio frequency telemetry apparatus for acquiring data from an underwater environment comprising:

an in-water station comprising a plurality of sensors, means for sampling the outputs of said plurality of sensors and, means for forming encoded data first in the form of electrical signals and then in the form of light signals for subsequent transmission;

said plurality of sensors comprising a test sensor array operatively disposed in said in-water station and in the underwater environment for generating signals in an analog format indicative of and characterized by the underwater environment,

said means for sampling and means for forming encoded data comprising a data acquisition device operatively connected to said test sensor array for sequentially sampling the test data from said test sensor array at predetermined rates for forming encoded words from the sampled values of each of said sensors together with a sensor identifier and furnishing at the output of the data acquistion device parallel processed multiplexed digital data representative of the test data derived from the test sensor array,

said data acquisition device of said in-water station comprising:

an analog multiplexer operatively connected to said test sensor array an in-water station microprocessor providing means for furnishing a predetermined select signal to said analog multiplexer so as to interleave the data from each sensor of said test sensor array so that the data from each of said sensors share a common channel in a time division multiplexed fashion at the output of said analog multiplexer,

the in-water station microprocessor being operatively connected to said data acquisition device for controlling the sampling of said test sensor array at the predetermined rates so as to control sampling rate and sequence, interim storage and flow rate of the test data and status information according to a predetermined operational program,

a sample-and-hold circuit operatively connected to the output of said analog multiplexer and to said in-water station microprocessor, said in-water station microprocessor providing means for furnishing a predetermined sample/-hold command signal to said sample-and-hold circuit so that the data from said test sensor array is sampled at the predetermined rates,

an analog-to-digital converter operatively connected to the output of said sample-and-hold circuit and to said in-water station microprocessor for digitizing the sampled data at its input so as to furnish, in a parallel format, a 12-bit two's complement digital code at its output, and

a single-pole, double-throw electronic switch operatively connected to a sensor and the output of said analog-to-digital converter and to said in-water station microprocessor, said in-water station microprocessor also providing means for furnishing a predetermined select signal to said single-pole, double-throw electronic switch so as gate alternately the signal from the output of said sensor and the signal from the output of said analog-to-digital converter to a parallel input port of said in-water station microprocessor,

a fiber optics cable operatively connected between said in-water station and a buoy station for propagating the encoded data in the form of light information from said in-water station to said buoy station thereby forming a fiber optics communication link therebetween; and

said in-water station further comprising an in-water station interface unit operatively connected to said in-water station microprocessor for the converting the parallel processed digital data into serial multiplexed digital data,

said in-water station further comprising an in-water station optical transmitter operatively connected at its input to the output of said in-water station interface unit and at its output connected to one end of the fiber optics cable providing means for modulating said in-water station optical transmitter with the serial multiplexed digital data so as to furnish the encoded data in the form of light signals and send it through fiber optics cable as a serial time-division multiplexed transmission;

a buoy station comprising a buoy station optical receiver operatively connected to the other end of said fiber optics cable for demodulating the serial time-divison multiplexed transmission at its input back into serial miltiplexed digital data at its output,

a buoy station buffer/amplifier operatively connected to the output of said buoy station optical receiver providing means for preventing said buoy station buffer/amplifier from influencing the operation of said buoy station optical receiver and providing means for conditioning and amplifying the serially multiplexed digital data at its input to a predetermined level at its output,

a buoy station radio frequency transmitter operatively connected at its input to the output of said buoy station buffer-/amplifier, the conditioned and amplified electrical serially processed multiplexed digital data being used to modulate said buoy station transmitter so as to furnish the encoded data in the form of modulated frequency information for subsequent transmission, and

a buoy station antenna operatively connected to the output of said buoy station transmitter for radiating the encoded data in the form of radio frequency information to said shore station; and

a receiving station comprising: a receiving station antenna for receiving the radiated encoded data in the form of radio frequency information from said buoy station antenna,

a receiving station radio frequency receiver operatively connected at its input to said receiving station antenna for demodulating the encoded data in the form of radio frequency information into a facsimile of the serially processed multiplexed digital data at its output,

a data processor operatively connected at its input to the output of said receiving station radio frequency receiver for executing a systmatic sequence of operations including data reduction and analysis of the serially processed multiplexed digital data at its input to cause transformation thereof into a more useful form of data, and

a data recorder operatively connected to the output of said data processor for recording the more useful form of data for subsequent additional analysis.

DESIGN PATENTS

GRANTED JUL. 8, 1986

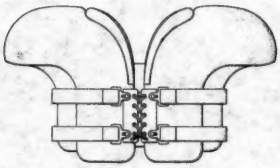
ERRATA

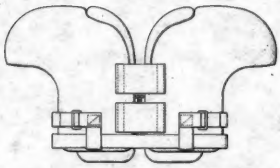
For CLASS	See PATENT NO.
D08–030	284,554
D09–451	284,563
D12–184	284,575
D03–100	284,602
D21–063	284,607

DESIGNS

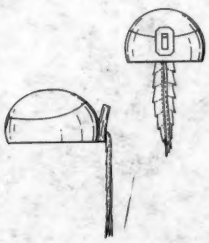
JULY 8, 1986

284,516
SHOULDER PADS FOR FOOTBALL PLAYERS
Robert B. Dyer, Birmingham, Ala., assignor to Vulcan Athletic Service Company, Inc., Leeds, Ala.
Filed Feb. 6, 1984, Ser. No. 577,519
Term of patent 14 years
U.S. Cl. D2—27



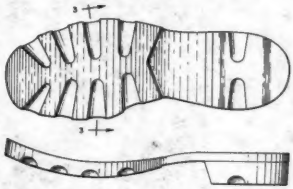


284,517
HAT
Scott S. Gray, 638 E. Main St., Barnesville, Ohio 43713
Filed Feb. 21, 1984, Ser. No. 581,892
Term of patent 14 years
U.S. Cl. D2—254

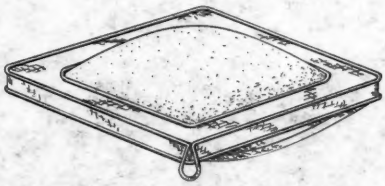


284,518
SHOE
Ralph L. Lowe, Jr., and Patrick S. Elliott, both of Pearland, Tex., assignors to Aspri Sports, Inc., Pearland, Tex.
Filed Apr. 17, 1984, Ser. No. 601,240
Term of patent 14 years
U.S. Cl. D2—310

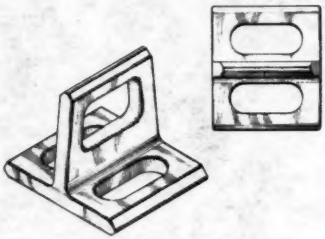
284,519
SOLE FOR FOOTWEAR
Richard A. Braga, Hudson; Carole A. Przygoda, Worcester; Richard F. Lacerte, Hudson, and Douglas S. Swain, Brockton, all of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Feb. 17, 1984, Ser. No. 584,066
Term of patent 14 years
U.S. Cl. D2—320



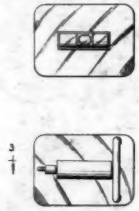
284,520
POT HOLDER FOR ARTHRITIC PERSONS
Carol Handler, 84 Armour St., Long Beach, N.Y. 11561
Filed Jan. 23, 1984, Ser. No. 572,855
Term of patent 14 years
U.S. Cl. D2—361.1



284,521
T-FITTING FOR A MOUNTAIN CLIMBER'S SLING
William E. Forrest, Denver, Colo., assignor to Forrest Mountaineering, Ltd., Denver, Colo.
Filed Apr. 27, 1984, Ser. No. 604,633
Term of patent 14 years
U.S. Cl. D2—405

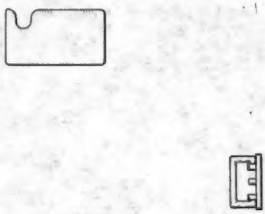


284,522
BELT BUCKLE
Jonmark Pierce, 2822 Eliot St., Denver, Colo. 80211
Filed Apr. 30, 1984, Ser. No. 605,184
Term of patent 14 years
U.S. Cl. D2—406

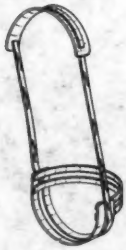


284,523
BELT BUCKLE
Alexis V. Kirk, New York, N.Y., assignor to Somersett Moon Ltd., New York, N.Y.
Filed Dec. 14, 1984, Ser. No. 681,879
Term of patent 14 years
U.S. Cl. D2—422

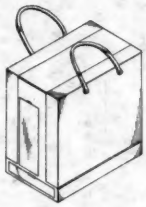
284,524
ORNAMENTAL BELT BUCKLE
Dennis Ainsworth, P.O. Box 134, Dill City, Okla. 73641
Filed Jul. 16, 1984, Ser. No. 631,053
Term of patent 14 years
U.S. Cl. D2—427

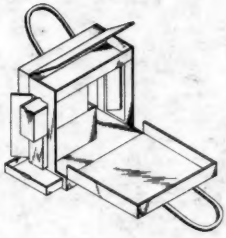


284,525
BABY AND INFANT CARRIER
Charles J. LeMaistre, R.R. 7, Fredericton, New Brunswick, Canada E3B 4X8
Filed Aug. 31, 1983, Ser. No. 528,142
Claims priority, application Canada, Jun. 28, 1983, 28-06-83-11
Term of patent 14 years
U.S. Cl. D3—31



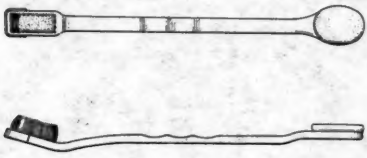
284,526
PORTABLE DESK
Nettie A. Freeman, R.R. #2, The Village, #57 Whispering Pine, Flint, Tex. 75762
Filed Feb. 28, 1983, Ser. No. 470,595
Term of patent 14 years
U.S. Cl. D3—74





284,527
CARRYING CASE FOR A PERSONAL COMPUTER
Myron F. Davis, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 7, 1983, Ser. No. 529,897
Term of patent 14 years
U.S. Cl. D3—76

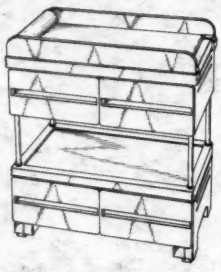
284,528
TOOTHBRUSH
Nelly M. Jurado, 11431 SW. 2nd St., Miami, Fla. 33174
Filed Jun. 22, 1984, Ser. No. 623,784
Term of patent 14 years
U.S. Cl. D4—105



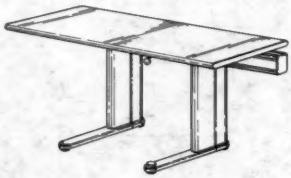
284,529
FOLDING STOOL
Adrian M. Reed, Glenfield, England, assignor to Robert George Banks, Suffolk, England
Filed Dec. 30, 1983, Ser. No. 567,250
Claims priority, application United Kingdom, Jul. 18, 1983, 831014156
Term of patent 14 years
U.S. Cl. D6—353

284,530
COMBINED DRESSING TABLE AND STORAGE UNIT FOR AN INFANT
Merry S. Riehm, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 9, 1984, Ser. No. 578,496
Term of patent 14 years
U.S. Cl. D6—384

284,531
COMBINED DRESSING TABLE AND STORAGE UNIT FOR AN INFANT
Merry S. Riehm, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 9, 1984, Ser. No. 578,624
Term of patent 14 years
U.S. Cl. D6—384



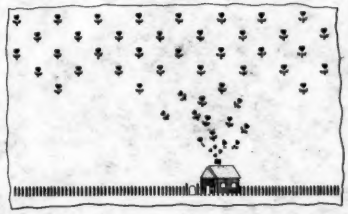
284,532
WORK TABLE
Franz Vogt, Pholheim, Fed. Rep. of Germany, assignor to Voko Franz Vogt & Co., Pohlheim, Fed. Rep. of Germany
Filed Apr. 25, 1983, Ser. No. 487,937
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1982, 21 MR 549
Term of patent 14 years
U.S. Cl. D6—428



284,533
TABLE
Richard D. Berry, Jr., Hickory, N.C., assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Jul. 11, 1983, Ser. No. 512,548
Term of patent 14 years
U.S. Cl. D6—478

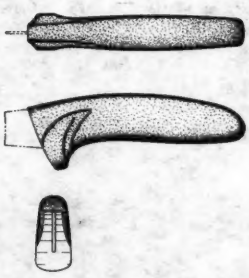
284,534
TABLE LEG OR SIMILAR ARTICLE
Gene E. Montenecourt, P.O. Box 392, Bloomsbury, N.J. 08804
Filed Feb. 13, 1984, Ser. No. 579,563
Term of patent 14 years
U.S. Cl. D6—495

284,535
TUMBLER OR SIMILAR ARTICLE
Peter A. Gobleck, Jr., Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Feb. 7, 1983, Ser. No. 464,750
Term of patent 14 years
U.S. Cl. D7—6



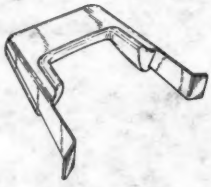
284,536
KNIFE HOLDER
Roger L. Kelly, Palatine, Ill., assignor to Ekco Housewares, Inc., Franklin Park, Ill.
Filed Feb. 6, 1984, Ser. No. 577,581
Term of patent 14 years
U.S. Cl. D7—74

284,537
KNIFE HANDLE
Robert Pashley, Lake Geneva, Wis.; Mary E. Burke, Crystal; William Peters, Maple Grove, both of Minn.; Robert L. Jacobi, Lake Geneva, Wis.; Ronald J. Gangelhoff, Mound, Minn.; Leonard E. Lewis, Middleton, Wis., and Richard Alvarez, Plymouth, Minn., assignors to Chicago Cutlery Consumer Products, Inc., Minneapolis, Minn.
Filed May 13, 1983, Ser. No. 494,178
Term of patent 14 years
U.S. Cl. D7—152

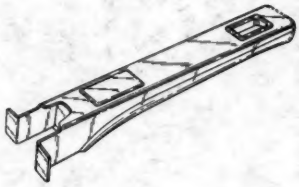


284,538
COFFEE ROASTER
Albrecht Friz, Giengen/Brz., Fed. Rep. of Germany, assignor to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany
Filed Aug. 9, 1983, Ser. No. 521,702
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1983, MR 5582
Term of patent 14 years
U.S. Cl. D7—354

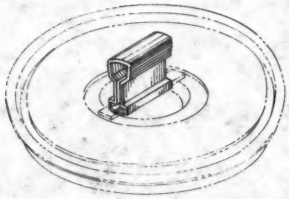
284,539
HANDLE FOR COOKING UTENSILS
Rolf Baumgarten, Neunkirchen-Wiederstein, Fed. Rep. of Germany, assignor to Heinrich Baumgarten KG Eisen und Blechwarenfabrik, Neunkirchen, Fed. Rep. of Germany
Division of Ser. No. 543,944, Oct. 20, 1983. This application Aug. 28, 1985, Ser. No. 770,499
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1983, MR367; Jun. 20, 1983, MR371
Term of patent 14 years
U.S. Cl. D7—393



284,540
HANDLE FOR COOKING UTENSILS
Rolf Baumgarten, Neunkirchen-Wiederstein, Fed. Rep. of Germany, assignor to Heinrich Baumgarten KG Eisen und Blechwarenfabrik, Neunkirchen, Fed. Rep. of Germany
Division of Ser. No. 543,944, Oct. 20, 1983. This application Aug. 28, 1985, Ser. No. 770,500
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1983, MR367; Jun. 20, 1983, MR371
Term of patent 14 years
U.S. Cl. D7—393

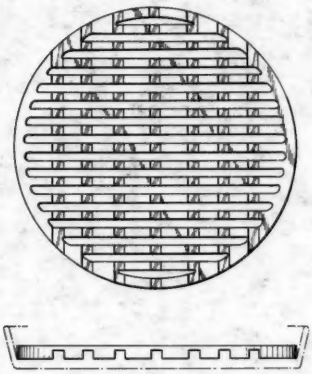


284,541
HANDLE FOR A UTENSIL LID
William E. Bartasevich, Kent, Ohio, assignor to The Meyer Company, Cleveland, Ohio
Filed Apr. 1, 1983, Ser. No. 481,342
Term of patent 14 years
U.S. Cl. D7—393



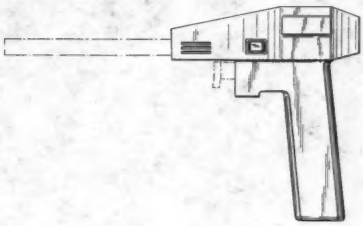
284,542
HANDLE FOR A CULINARY TOOL
Roger L. Kelly, Eau Claire, Wis., assignor to Ekco Housewares, Inc., Franklin Park, Ill.
Filed Jan. 9, 1984, Ser. No. 569,196
Term of patent 14 years
U.S. Cl. D7—395

284,543
FRYING PAN GREASE DRAIN INSERT
Ronald Huls, 13445 Bromwich St., Arleta, Calif. 91331
Filed Jul. 26, 1982, Ser. No. 401,891
Term of patent 14 years
U.S. Cl. D7—409

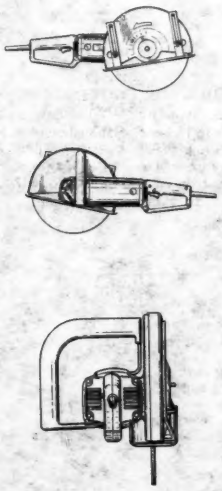


284,544
GARDENING IMPLEMENT
Walter Kolb, Betzdorf, Fed. Rep. of Germany, assignor to Wolf-Gerate GmbH, Fed. Rep. of Germany
Filed May 28, 1982, Ser. No. 383,156
Term of patent 14 years
U.S. Cl. D8—11

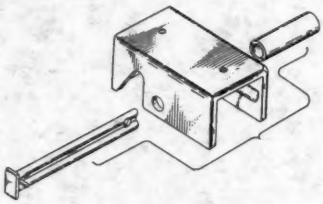
284,545
HOUSING FOR SELF-IGNITING GAS TORCH
John M. Nelson, Brockport, and Robert M. Kahute, Honeoye Falls, both of N.Y., assignors to Newell Companies, Inc., Freeport, Ill.
Filed Jun. 10, 1983, Ser. No. 503,214
Term of patent 14 years
U.S. Cl. D8—30



284,546
CUTTER
Hideki Kawakami, Ibara, and Tetsuyuki Doi, Fukuyama, both of Japan, assignors to Ryobi Ltd, Tokyo, Japan
Filed Mar. 23, 1983, Ser. No. 478,077
Claims priority, application Japan, Oct. 12, 1982, 57-46462
Term of patent 14 years
U.S. Cl. D8—66



284,547
LOCKABLE HOLDER FOR CONTAINERS
Treesa A. Spencer, 2818 S. Diamond, Santa Ana, Calif. 92704
Filed Nov. 28, 1983, Ser. No. 555,830
Term of patent 14 years
U.S. Cl. D8—373

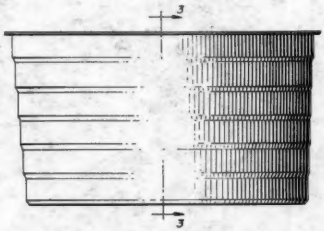


284,548
FRAGRANCE CONTAINER
Marc A. Rosen, New York, N.Y., assignor to Eli Lilly and Company, Indianapolis, Ind.
Filed Jan. 30, 1984, Ser. No. 574,810
Term of patent 14 years
U.S. Cl. D9—377

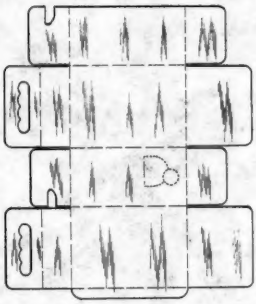
284,549
FLASK
Marcel Vaussanvin, Tournus, France, assignor to Manufacture Metallurgique de Tournus, Tournus, France
Filed Feb. 22, 1984, Ser. No. 582,624
Term of patent 14 years
U.S. Cl. D9—384

284,550
BOTTLE
Dennis Parrack, Whitley Bay, England, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Jan. 7, 1983, Ser. No. 457,292
Term of patent 14 years
U.S. Cl. D9—395

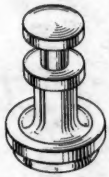
284,551
CAN OR SIMILAR ARTICLE
Jozef I. Franek, Chorleywood, and Keith R. Irvine, Faringdon, both of England, assignors to Metal Box Public Limited Company, Reading, England
Filed Apr. 15, 1983, Ser. No. 485,727
Claims priority, application United Kingdom, Oct. 21, 1982, 1 009 360
The portion of the term of this patent subsequent to Sep. 24, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—428



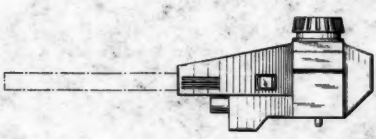
284,552
BLANK FOR A CARTON
Ronald Weaver, London, England, assignor to Ti Bottle & Packaging Services Limited, London, England
Filed Aug. 12, 1983, Ser. No. 522,537
Claims priority, application United Kingdom, Feb. 16, 1983, 1011476
Term of patent 14 years
U.S. Cl. D9—433



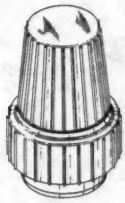
284,553
CLOSURE FOR CONTAINERS
Kenneth D. Collister, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.
Filed Mar. 7, 1984, Ser. No. 587,048
Term of patent 14 years
U.S. Cl. D9—435



284,554
HOUSING FOR SELF-IGNITING GAS TORCH
John M. Nelson, Brockport, and Robert M. Kahute, Honeoye Falls, both of N.Y., assignors to Newell Companies, Inc., Freeport, Ill.
Filed Mar. 23, 1983, Ser. No. 478,139
Term of patent 14 years
U.S. Cl. D8—30

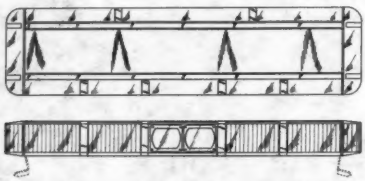


284,555
CAP FOR BOTTLE
Pieter Schornagel, Hattem, Netherlands, assignor to Lever Brothers Company, New York, N.Y.
Filed Oct. 7, 1983, Ser. No. 539,858
Claims priority, application Hague, Apr. 11, 1983, DM/002425
Term of patent 14 years
U.S. Cl. D9—453

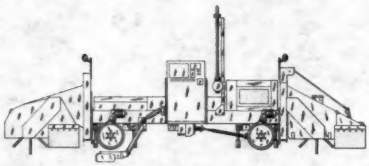


284,556
COMBINED WATCH AND BRACELET
Joseph Kanoui, Geneve, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Filed Oct. 13, 1983, Ser. No. 541,706
Claims priority, application France, Apr. 14, 1983, 831 386
Term of patent 14 years
U.S. Cl. D10—39

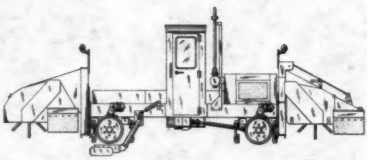
284,557
WARNING LIGHT SYSTEM FOR VEHICLES
Robert A. Ferenc, Middletown, Conn., assignor to Whelen Engineering Co Inc., Deep River, Conn.
Filed Dec. 27, 1983, Ser. No. 565,298
Term of patent 14 years
U.S. Cl. D10—114



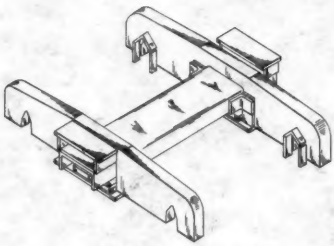
284,558
RAILWAY TRACK BROOM MACHINE
Joseph L. Bosko, Montgomery, Ala., assignor to Kershaw Manufacturing Company, Inc., Montgomery, Ala.
Filed Oct. 3, 1983, Ser. No. 538,479
Term of patent 14 years
U.S. Cl. D12—36



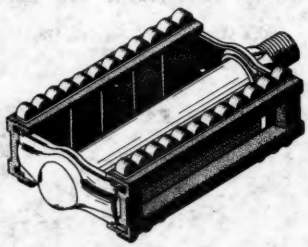
284,559
RAILWAY TRACK BROOM MACHINE WITH CAB
Joseph L. Bosko, Montgomery, Ala., assignor to Kershaw Manufacturing Company, Inc., Montgomery, Ala.
Filed Oct. 3, 1983, Ser. No. 538,480
Term of patent 14 years
U.S. Cl. D12—36



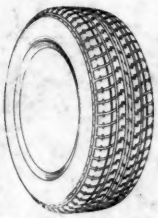
284,560
TRUCK FOR A RAIL TRAVERSING CAR
Joseph L. O'Lear, Irwin, Pa., assignor to Huwood-Irwin Co., Irwin, Pa.
Filed Apr. 21, 1983, Ser. No. 487,030
Term of patent 14 years
U.S. Cl. D12—46



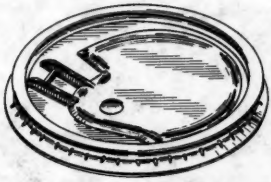
284,561
BICYCLE PEDAL
Carlton P. Pawsat, and David K. McMurtrey, both of Maysville, Ky., assignors to Wald Manufacturing Co., Inc., Maysville, Ky.
Filed Dec. 7, 1983, Ser. No. 559,033
Term of patent 14 years
U.S. Cl. D12—125



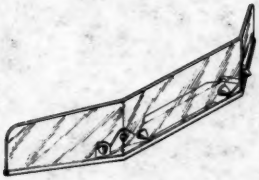
284,562
AUTOMOBILE TIRE
Hiroshi Kojima, Tokyo; Misao Kawabata, Saitama; Kazuo Obata, and Hisao Ushikubo, both of Tokyo, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan
Filed Dec. 14, 1983, Ser. No. 561,258
Claims priority, application Japan, Jul. 1, 1983, 58-28189; Jul. 25, 1983, 58-32266
Term of patent 14 years
U.S. Cl. D12—147



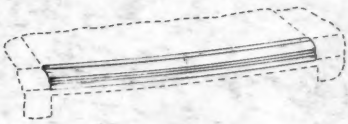
284,563
CUP LID
Dennis Merino, 2873 King Edward Dr., El Dorado Hills, Calif. 95630
Filed Nov. 22, 1983, Ser. No. 554,225
Term of patent 14 years
U.S. Cl. D9—451



284,564
COMBINED MOTORCYCLE FAIRING BUG DEFLECTOR AND MOUNTING BRACKET
Ivyl D. Kopecky, Ypsilanti, N. Dak., assignor to K.A.S. Manufacturing, Inc., Jamestown, N. Dak.
Filed Mar. 22, 1984, Ser. No. 592,057
Term of patent 14 years
U.S. Cl. D12—182

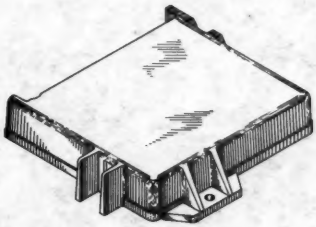


284,565
TRIM PIECE FOR AN AUTOMOBILE HOOD
Ulric W. Trombley, Chisago City, and Richard J. Nozel, West St. Paul, both of Minn., assignors to Double D Specialties, Inc., St. Paul, Minn.
Filed Jan. 30, 1984, Ser. No. 575,065
Term of patent 14 years
U.S. Cl. D12—190



284,566
BOAT
Allan B. Hegg; Lloyd S. Makowski, both of Manistee, and James S. Phares, Farmington Hills, all of Mich., assignors to Century Boat Company, Manistee, Mich.
Filed Sep. 28, 1983, Ser. No. 536,718
Term of patent 14 years
U.S. Cl. D12—313

284,567
COMBINED ELECTRONIC ENCLOSURE AND HEAT SINK APPARATUS OR SIMILAR ARTICLE
David J. Cox, Elgin; Roy E. Hunninghaus; Keith D. Meyer, both of Des Plaines, and George Wozniczka, Chicago, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 2, 1983, Ser. No. 557,308
Term of patent 14 years
U.S. Cl. D13—15

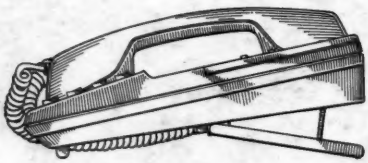


284,568

TELEPHONE

Yoku Yamagami, and Sadao Takatsuka, both of Maebashi, Japan, assignors to Nakayo Telecommunications, Inc., Tokyo, Japan

Filed Nov. 2, 1983, Ser. No. 547,886
Claims priority, application Japan, May 19, 1983, 58-20852
Term of patent 14 years
U.S. Cl. D14—53

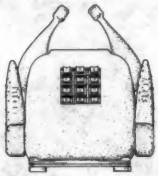


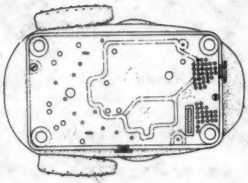
284,569

TELEPHONE BASE

Gerald W. Anz, San Antonio, Tex., assignor to Talkin' Turkey Telephone Company, San Antonio, Tex.

Filed Apr. 3, 1984, Ser. No. 596,313
Term of patent 14 years
U.S. Cl. D14—53





284,570

TELEPHONE INSTRUMENT OR SIMILAR ARTICLE

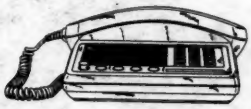
Harry Hentschel, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 29, 1983, Ser. No. 556,103

Claims priority, application Fed. Rep. of Germany, May 31, 1983, 13447

Term of patent 14 years

U.S. Cl. D14—53



284,571

TELEPHONE SET

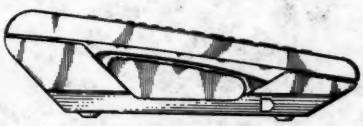
Eric J. Marshall, London, England, assignor to The Marshall Telephone Corporation Limited, Kent, England

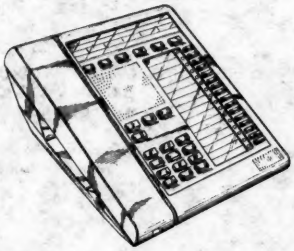
Filed Dec. 9, 1983, Ser. No. 559,697

Claims priority, application United Kingdom, Jun. 10, 1983, 1013507

Term of patent 14 years

U.S. Cl. D14—53





284,572

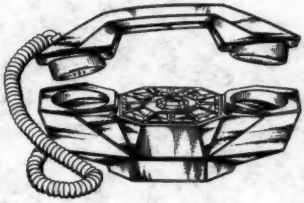
TELEPHONE APPARATUS

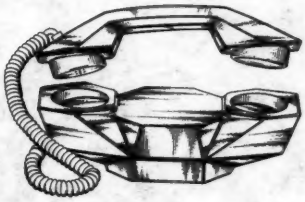
George D. Perkins, Eugene, Oreg., assignor to Comdial Consumer Communications Corporation, El Monte, Calif.

Filed Dec. 29, 1983, Ser. No. 566,489

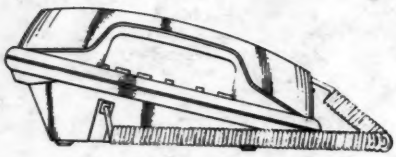
Term of patent 14 years

U.S. Cl. D14—53





284,573
TELEPHONE
Teturo Ando, Tokyo, Japan, assignor to Kabushikikaisha Taiko-denki Seisakusho, Tokyo, Japan
Filed Sep. 27, 1983, Ser. No. 536,338
Claims priority, application Japan, Mar. 31, 1983, 58-13571
Term of patent 14 years
U.S. Cl. D14—58

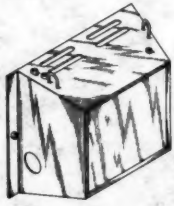


284,574
KEYBOARD OR SIMILAR ARTICLE
Roy K. Fischer, Paradise Valley, Ariz., assignor to International Telephone & Telegraph Corp., New York, N.Y.
Filed Nov. 30, 1983, Ser. No. 556,488
Term of patent 14 years
U.S. Cl. D14—100

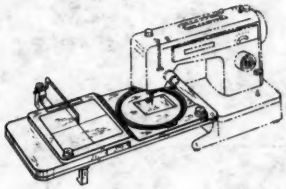
284,575
VEHICLE FENDER LINER
Michael Latas, 12345 Lakepoint Dr., St. Louis, Mo. 63043
Filed Jan. 30, 1984, Ser. No. 574,897
Term of patent 14 years
U.S. Cl. D12—184

284,576
DIESEL ENGINE AIR FILTER MOUNT
Weir E. Beckon, 10166 Boone Cir., Bloomington, Minn. 55438
Filed Jan. 27, 1983, Ser. No. 461,593
Term of patent 14 years
U.S. Cl. D15—5

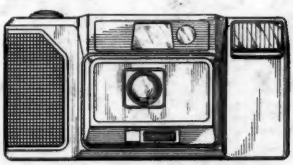
284,577
HOUSING FOR HYDRAULIC POWER UNIT FOR A LOADER ATTACHMENT
Robert J. DuBose, 2361 Durham-Dayton Hwy., Durham, Calif. 95938
Filed Dec. 18, 1984, Ser. No. 682,875
Term of patent 14 years
U.S. Cl. D15—28



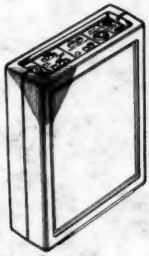
284,578
EMBROIDERY MACHINE
Yoshihide Yoneda, Hirakata, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Osaka, Japan
Filed Jun. 23, 1983, Ser. No. 506,972
Claims priority, application Japan, Feb. 14, 1983, 58-5476; Feb. 15, 1983, 58-5750
Term of patent 14 years
U.S. Cl. D15—72



284,579
PHOTOGRAPHIC CAMERA
Fumitaka Io, and Yuuji Takarabe, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Apr. 24, 1984, Ser. No. 603,486
Claims priority, application Japan, Oct. 31, 1983, 58-47599
Term of patent 14 years
U.S. Cl. D16—6

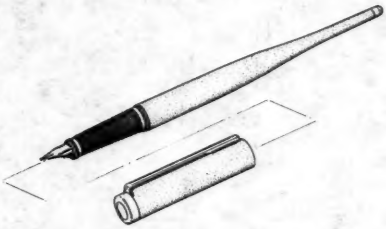


284,580
STRINGED INSTRUMENT AMPLIFIER OR THE LIKE
Donald T. Scholz, 13 Rich Valley Rd., Wayland, Mass. 01778
Filed Dec. 27, 1982, Ser. No. 453,759
Term of patent 14 years
U.S. Cl. D17—20

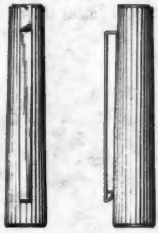


284,581
EMERGENCY MICROFILMED MEDICAL AND IDENTIFICATION RECORD
Alfred L. Peterson, 2570 Oakwood Cir., Salt Lake City, Utah 84019
Filed Apr. 2, 1984, Ser. No. 595,996
Term of patent 14 years
U.S. Cl. D19—10

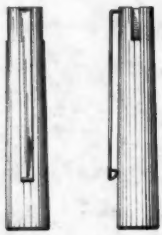
284,582
FOUNTAIN PEN FOR ARTISTS AND CALLIGRAPHERS OR THE LIKE
Bernhard Bruhn, Halstenbek, Fed. Rep. of Germany, assignor to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.
Filed Dec. 8, 1983, Ser. No. 559,283
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1983, 66MR11628
Term of patent 14 years
U.S. Cl. D19—48



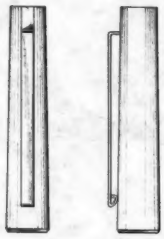
284,583
WRITING INSTRUMENT CAP
Clarence Zierhut, Richardson, Tex., assignor to The Gillette Company, Boston, Mass.
Filed Jan. 6, 1984, Ser. No. 568,972
Term of patent 14 years
U.S. Cl. D19—57



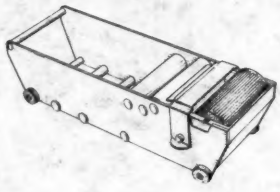
284,584
WRITING INSTRUMENT CAP
Clarence Zierhut, Richardson, Tex., assignor to The Gillette Company, Boston, Mass.
Filed Jan. 6, 1984, Ser. No. 568,973
Term of patent 14 years
U.S. Cl. D19—57



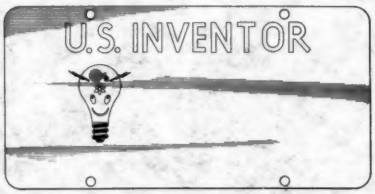
284,585
WRITING INSTRUMENT CAP
Clarence Zierhut, Richardson, Tex., assignor to The Gillette Company, Boston, Mass.
Filed Mar. 12, 1984, Ser. No. 588,624
Term of patent 14 years
U.S. Cl. D19—57



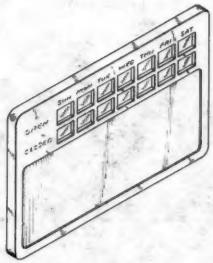
284,586
COMBINED DISPENSER AND MOISTENING DEVICE FOR ADHESIVE TAPE
Bo Runbjörk, Anderstorp, Sweden, assignor to AB Verktyg & Press, Anderstorp, Sweden
Filed Mar. 22, 1983, Ser. No. 477,795
Claims priority, application Sweden, Sep. 23, 1982, 82-2303
Term of patent 14 years
U.S. Cl. D19—69



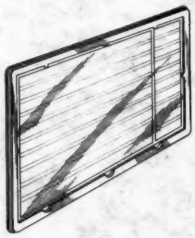
284,587
INVENTOR'S RECOGNITION PLATE
Phillip L. Nally, 302 W. Muir St., Bardstown, Ky. 40004
Filed Jun. 22, 1983, Ser. No. 432,343
Term of patent 14 years
U.S. Cl. D20—14



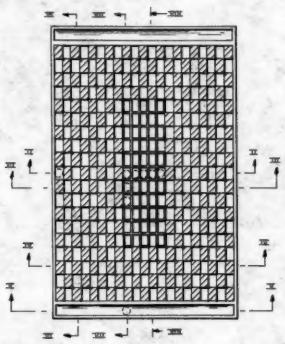
284,588
RETAIL STORE ADVERTISING DISPLAY
William V. Silver, New York, N.Y., assignor to Thomson-Leeds Company, Inc., New York, N.Y.
Filed Apr. 25, 1983, Ser. No. 488,121
Term of patent 14 years
U.S. Cl. D20—42



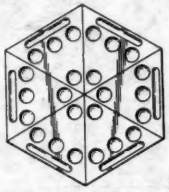
284,589
DISPLAY BOARD ASSEMBLY
Houston F. James, 8350 Moberly La., Dallas, Tex. 75227
Filed Oct. 31, 1983, Ser. No. 547,045
Term of patent 14 years
U.S. Cl. D20—42



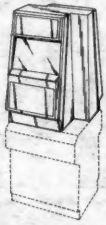
284,590
GAMEBOARD
Juanita M. Donahue, 1010 S. Hughes, Little Rock, Ark. 72204
Filed Mar. 1, 1984, Ser. No. 585,310
Term of patent 14 years
U.S. Cl. D21—17



284,591
GAME BOARD
Peter Schuck, Munich, Fed. Rep. of Germany, assignor to Affaril Handelsanstalt, Vaduz, Liechtenstein
Filed Aug. 15, 1983, Ser. No. 523,177
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1983, 183/83
Term of patent 14 years
U.S. Cl. D21—20

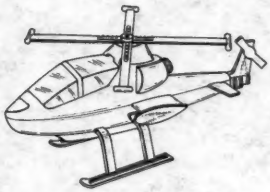


284,592
ELECTRONIC GAME MACHINE OR SIMILAR ARTICLE
John G. Drews; Peter D. Dickinson, and Donald C. Stephan, all of Reno, Nev., assignors to IGT, Reno, Nev.
Filed May 24, 1984, Ser. No. 614,413
Term of patent 14 years
U.S. Cl. D21—38



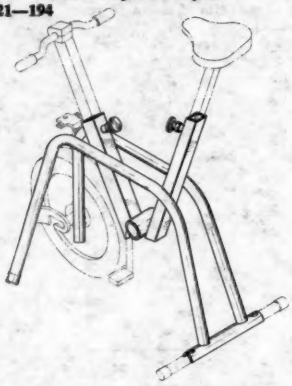
284,593
JOYSTICK CONTROL FOR VIDEO GAMES AND COMPUTER SYSTEMS
Frank L. Happ, Buffalo Grove, Ill., assignor to Coin Controls, Inc., Elk Grove, Ill.
Filed Mar. 27, 1984, Ser. No. 594,673
Term of patent 14 years
U.S. Cl. D21—48

284,594
TOY HELICOPTER
Robert C. Fisher, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 9, 1984, Ser. No. 578,669
Term of patent 14 years
U.S. Cl. D21—85

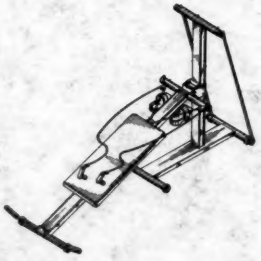


284,595
CUPID-UNICORN (CUPICORN) THE LOVE UNICORN
John F. Herndon, 1829 S. Sandra La., West Palm Beach, Fla. 33406
Filed Oct. 24, 1983, Ser. No. 544,962
Term of patent 14 years
U.S. Cl. D21—165

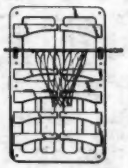
284,596
YOKE FOR AN EXERCISE BICYCLE
Ronald A. McNeil, Havana, Fla., assignor to R.A.M. Innovations, Inc., Havana, Fla.
Filed Dec. 17, 1984, Ser. No. 682,175
Term of patent 14 years
U.S. Cl. D21—194



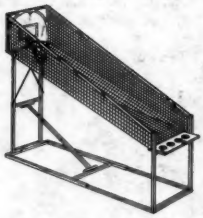
284,597
INCLINED PHYSICAL EXERCISER
David B. Smith, Mercer Island, Wash., and Gary M. Bang, Edmonds, Wash., assignors to Precor Incorporated, Redmond, Wash.
Filed Jan. 29, 1985, Ser. No. 696,250
Term of patent 14 years
U.S. Cl. D21—195



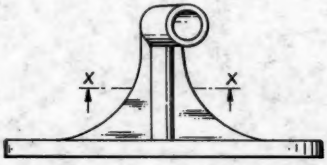
284,598
ADJUSTABLE BASKETBALL GOAL
Anvar Zahir, 1417 Cabrillo, Burlingame, Calif. 94010
Filed Feb. 27, 1984, Ser. No. 519,102
Term of patent 14 years
U.S. Cl. D21—201



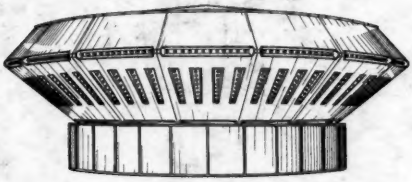
284,599
COMBINED BASKETBALL GAME GOAL AND RETURN NET
Ken C. Cochran, P.O. Box 1073, Salina, Kans. 67402-1073
Filed Jan. 6, 1984, Ser. No. 568,820
Term of patent 14 years
U.S. Cl. D21—201



284,600
PUTTER HEAD
Kenneth W. Burgess, Macclesfield, England, assignor to The E.C.K. Manufacturing Co. Limited, Macclesfield, England
Filed Dec. 19, 1983, Ser. No. 563,085
Claims priority, application United Kingdom, Jun. 17, 1983, 1013631
Term of patent 14 years
U.S. Cl. D21—219

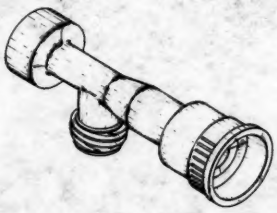


284,601
AMUSEMENT RIDE STRUCTURE
Victor L. Wisdom, Sterling; Mark E. Waite, Brush, and Bradford H. Rhea, Sterling, all of Colo., assignors to Wisdom Manufacturing, Inc., Sterling, Colo.
Filed Dec. 7, 1983, Ser. No. 558,369
Term of patent 14 years
U.S. Cl. D21—242

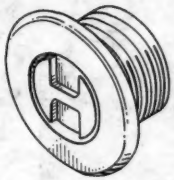


284,602
WAD CARRIER
Roby N. Matney, 1721 Mississippi St., County of Cole, Mo. 65101
Filed Oct. 13, 1983, Ser. No. 541,377
Term of patent 14 years
U.S. Cl. D3—100

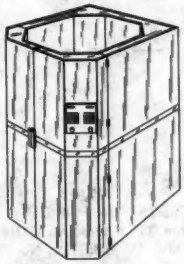
284,603
SYPHON FITTING
Edward G. Loignon, 11502 Dena, Artesia, Calif. 90701
Filed Nov. 25, 1983, Ser. No. 555,030
Term of patent 14 years
U.S. Cl. D23—40



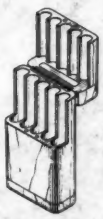
284,604
AIR CONTROL APPARATUS
Cleo D. Mathis, 1808 Potrero Ave., South El Monte, Calif. 91733
Filed Sep. 13, 1982, Ser. No. 416,956
Term of patent 14 years
U.S. Cl. D23—41



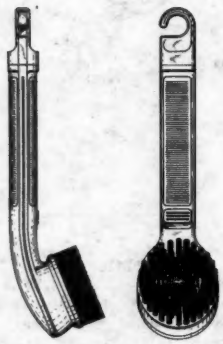
284,605
PHOTOTHERAPY CABINET
David W. Swanson, and Linda C. Swanson, both of Bryan, Ohio, assignors to Daavlin Company, Bryan, Ohio
Filed Apr. 1, 1983, Ser. No. 481,478
Term of patent 14 years
U.S. Cl. D24—39



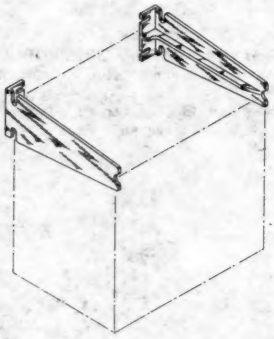
284,606
CONTAINER FOR TOBACCO PRODUCTS
Daniel M. Koontz, 7810 Bradley Rd., P.O. Box 400, Somis, Calif. 91006
Filed Aug. 13, 1984, Ser. No. 639,851
Term of patent 14 years
U.S. Cl. D27—47



284,607
BODY WASHING IMPLEMENT WITH BRUSH AND SPONGE HEADS
Ronald L. Muller, Old Saybrook, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Jul. 13, 1983, Ser. No. 513,515
Term of patent 14 years
U.S. Cl. D28—63

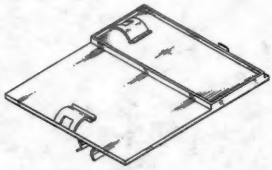


284,608
PAIR OF BRACKETS FOR HOLDING A PLASTIC BAG
William D. Hampton, 110 B Estates Dr., Roseville, Calif. 95678
Filed Jul. 19, 1985, Ser. No. 756,536
Term of patent 14 years
U.S. Cl. D34—6



284,609
CART FOR DATA PAPER
Beverly C. Rich, 1310 Maywood Ave., Ruxton, Md. 21204
Filed Oct. 1, 1984, Ser. No. 656,763
Term of patent 14 years
U.S. Cl. D34—17

284,610
CLIPBOARD ATTACHMENT FOR SHOPPING CARTS
Garrett R. Harris, and Frances T. Harris, both of 16 Mitchell Ave., Red Deer, Canada T4N0L2
Filed Aug. 29, 1983, Ser. No. 527,189
Claims priority, application Canada, Mar. 28, 1983, D28-0383-3
Term of patent 14 years
U.S. Cl. D34—27



284,611
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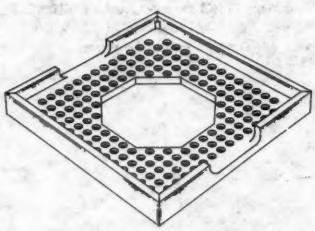
Garland D. Cotney, and Scot W. Taylor, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 1, 1983, Ser. No. 519,336
Term of patent 14 years
U.S. Cl. D34—40



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TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF JULY, 1986

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Nattermann & Cie GmbH: *See—*
Lautenschlager, Hans-Heiner; Parnham, Michael J.; and Prop, Gerrit, 4,599,205, Cl. 558-170.000.

A. O. Smith Corp.: *See—*
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A V L Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof. Dr. Dr. h.c. Hans List: *See—*
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Abatjoglou, Anthony G.: *See—*
Billig, Ernst; Abatjoglou, Anthony G.; Bryant, David R.; Murray, Rex E.; Mather, John M.; and Hsu, Song K., 4,599,059, Cl. 418-236.000.
Billig, Ernst; Abatjoglou, Anthony G.; Bryant, David R.; Murray, Rex E.; and Mather, John M., 4,599,206, Cl. 558-85.000.

Abbott, John A. Radiant heat engine. 4,598,550, Cl. 60-641.800.

Abbott, Vaughan: *See—*
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Furuhata, Takashi; Nakama, Taihei; Abe, Yuuhei; and Satoh, Kenji, 4,599,569, Cl. 328-111.000.

Abel, Martin L., to Permawick Bearing Corporation. Cartridge bearing assembly. 4,599,006, Cl. 384-136.000.

Abell, Ian D.: *See—*
Jowitt, Raymond; and Abell, Ian D., 4,598,577, Cl. 73-23.000.

Abenaim, Jacques. Foldable frame type luggage. 4,598,802, Cl. 190-107.000.

ABM Industries, Inc.: *See—*
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Accurate Industries, Inc.: *See—*
Rasmussen, Robert, 4,599,040, Cl. 414-786.000.

AccuRay Corporation: *See—*
Cho, Boong Y., 4,599,514, Cl. 250-359.100.

Accutome, Inc.: *See—*
Kremer, Frederic B.; and O'Brien, Edward R., 4,598,714, Cl. 128-660.000.

ACF Industries, Incorporated: *See—*
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Acorn Equipment Corp.: *See—*
Zyduck, Ronald L., 4,599,029, Cl. 414-297.000.

Acra-Plant, Inc.: *See—*
Robertson, Forrest E.; and Williams, Donald E., 4,598,654, Cl. 111-88.000.

Adachi, Hiroaki: *See—*
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Adama, David J., to Conveyor Corporation of America, Inc. Powered roller diverter. 4,598,815, Cl. 198-372.000.

Adams, Don L.: *See—*
Fischer, William C.; Adams, Don L.; Wright, Stuart C.; and Verzella, David J., 4,599,698, Cl. 364-551.000.

Adams, Wesley T. Nutcracker with automatic adjustment means. 4,598,475, Cl. 30-120.500.

Adir, S.A.R.L.: *See—*
Regnier, Gilbert; Guillonneau, Claude; Duhault, Jacques; and Roman, Francois, 4,599,338, Cl. 514-265.000.

Adolphi, Heinrich: *See—*
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Seufert, Walter; Loeffler, Hans-Peter; Schirmer, Ulrich; Seppelt, Wolfgang; and Adolphi, Heinrich, 4,599,329, Cl. 514-119.000.

AG Segerstrom och Svensson: *See—*
Arvidsson, Krister, 4,598,952, Cl. 301-37.00C.

AGA AB: *See—*
Vasek, Gilbert J., 4,598,501, Cl. 51-425.000.

Agdanowski, Ronald T.; and Geil, James A., to Sherwood Medical Company. Medical tube with inflation cuff. 4,598,707, Cl. 128-207.150.

Agfa-Gevaert Aktiengesellschaft: *See—*
Podszun, Wolfgang; Witte, Josef; Uytterhoeven, Herman; and Goossens, John, 4,599,291, Cl. 430-114.000.
Scheerer, Rainer, 4,599,302, Cl. 430-506.000.

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Ahrens, Kurt H.: *See—*
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Aiba, Masahiko; Kuranishi, Masaaki; and Miyake, Hideyuki, to Sharp Kabushiki Kaisha. Atmospheric pressure chamber in an ink jet system printer. 4,599,624, Cl. 346-75.000.

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Hausman, Mary L.; Miller, Gerald D.; and Wempe, Lawrence K., 4,599,378, Cl. 524-554.000.

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Beteille, Roger H., 4,598,888, Cl. 244-76.00R.

Aisin Seiki Kabushiki Kaisha: *See—*
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Akiyama, Tsutomu: *See—*
Saito, Etsuro; Takahashi, Shinichiro; Yuasa, Masami; and Akiyama, Tsutomu, 4,599,663, Cl. 360-97.000.

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Aikioniemi, Vilho, 4,598,897, Cl. 254-29.00A.

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Milling, Gunnar S., 4,598,743, Cl. 141-296.000.

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Kersten, Hilde; and Meyer, Gerhard, 4,599,467, Cl. 568-867.000.

Alavi, Kambiz; Cho, Alfred Y.; Pearsall, Thomas P.; and Temkin, Henryk, to AT&T Bell Laboratories. Multi-quantum well laser emitting at 1.5 μm. 4,599,728, Cl. 372-45.000.

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Ashmead, Harvey H., 4,599,152, Cl. 204-72.000.

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Salamon, Zoltan; Imre nee Virag, Ilona; and Sebestyen, Magdolna, 4,599,345, Cl. 514-311.000.

Alkire, Gerald R.; Frank, Woodrow W., Jr.; and Thompson, Robert W., to Westinghouse Electric Corp. Inflatable seal for an annular cavity. 4,598,580, Cl. 73-104.000.

Allen, James S.: *See—*
Johnson, David C.; and Allen, James S., 4,598,741, Cl. 141-5.000.

Allied Colloids Ltd.: *See—*
Flesher, Peter; Farrar, David; and Benson, Alan C., 4,599,379, Cl. 524-801.000.

Allied Corporation: *See—*
Blanchard, William C., 4,599,609, Cl. 342-602.000.
Edwards, Hugh A.; and Patchell, John W., 4,599,121, Cl. 156-48.000.
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Kwon, Young D.; Kavesh, Sheldon; and Prevorsek, Dusan C., 4,599,267, Cl. 428-364.000.

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Bronson, Larry D.; and Couperus, Egbert, 4,598,875, Cl. 241-78.000.

Allread, James J.; and Lenz, Donald C., to Grede Foundries Inc. Apparatus for automated mixing and transport of chemically bonded sand mixtures for casting. 4,598,759, Cl. 164-155.000.

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Wuhrmann, Juan C.; Brands, Karl D.; Mueller, Heinz; Schumann, Klaus; and Altenschoepfer, Theodor, 4,599,189, Cl. 252-174.150.
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Bright, John H., 4,599,153, Cl. 204-105.00R.
Conrow, Ransom B.; and Bernstein, Seymour, 4,599,203, Cl. 260-506.000.
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Scalfarotto, Robert E., 4,599,139, Cl. 162-168.300.
American Hospital Supply Corp.: *See—*
Nashef, Aws S., 4,599,084, Cl. 623-16.000.
American Magnetics Corporation: *See—*
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American Standard Inc.: *See—*
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American Stress Technologies, Inc.: *See—*
Tiitto, Seppo I.; and Mielityinen-Tiitto, Kirsti I., 4,599,563, Cl. 324-232.000.
Amerigo Technology Limited: *See—*
Young, Peter J.; and Romocki, Julian M. E., 4,599,182, Cl. 252-8.55C.
Ames, John T., III. Lock bracket for bicycles. 4,598,847, Cl. 224-39.000.
Amey, Ronald L., to Du Pont de Nemours, E. I., and Company. Manufacture of pyridine. 4,599,422, Cl. 546-251.000.
AMF Incorporated: *See—*
Bell, Richard E., 4,599,588, Cl. 335-127.000.
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AMGEN: *See—*
Altrock, Bruce W., 4,599,306, Cl. 435-7.000.
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Amon, Albert; and Weil, Roger, to Sicpa Holding S.A. Desensitizing ink for wet offset printing. 4,599,111, Cl. 106-21.000.
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Cohen, Thomas S., 4,598,961, Cl. 339-17.00C.
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Rose, William H.; Shaffer, David T.; and Walker, Philip J., 4,599,497, Cl. 200-5.00R.
Schlunz, James R.; and Stillie, Donald G., 4,598,472, Cl. 29-848.000.
Andersen, Robert P.: *See—*
Douglas, Robert J.; Doughty, Robert L.; Mungovan, John P.; Andersen, Robert P.; and Abbott, Vaughan, 4,599,101, Cl. 65-164.000.
Anderson, Carl E. Scaffolding system. 4,598,794, Cl. 182-113.000.
Anderson, Edward A.; and Sandi, Ernesto S. Component assembly and tape for nondestructive debonding. 4,599,263, Cl. 428-225.000.
Anderson, Patricia P.: *See—*
Takekoshi, Tohru; and Anderson, Patricia P., 4,599,396, Cl. 528-185.000.
Ando, Masao; and Tanimura, Masatake, to Mitsubishi-Kasei Technoengineers Ltd. Method for controlling simulated moving bed system. 4,599,115, Cl. 127-46.100.
Ando, Toshihiro; Nakanishi, Yutaka; and Ukita, Kenkichi, to Denki Kagaku Kogyo Kabushiki Kaisha. Photo-curable adhesive composition for glass lamination and laminated glass and process for its production. 4,599,274, Cl. 428-442.000.
Anelva Corporation: *See—*
Murakami, Shunichi; Ishida, Tetsuo; and Sakai, Junro, 4,599,069, Cl. 432-253.000.
Anglin, Jeanne M.; Edwards, Richard R.; and Thomas, John E., to Boeing Company, The. Composite structures having conductive surfaces. 4,599,255, Cl. 428-73.000.
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Arakawa, Yoshio: *See—*
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; and Suyama, Tadakazu, 4,599,343, Cl. 514-299.000.
Araps, Constance J.; Kandetzke, Steven M.; Kutner, Ellen L.; and Takacs, Mark A., to International Business Machines Corporation. Method for preparation of semiconductor structures and devices which utilize polymeric dielectric materials. 4,599,136, Cl. 156-643.000.
Arcade Engineering, Inc.: *See—*
Halliburton, Ronald D., 4,598,910, Cl. 273-119.00A.
Arcadian Corporation: *See—*
Hawkins, Edwin F., 4,599,102, Cl. 71-30.000.
Arco Industries, Ltd.: *See—*
Noble, Sid, 4,598,491, Cl. 42-58.000.
Arenas, Alvaro; Bales, Thomas O.; and Box, John W., to Cordis Corporation. Feedthrough. 4,598,466, Cl. 29-623.200.
Arguin, Gerard, to Arguin Trailer Frame, Inc. Tandem trailer system. 4,598,924, Cl. 280-408.000.
Arguin Trailer Frame, Inc.: *See—*
Arguin, Gerard, 4,598,924, Cl. 280-408.000.
Arikawa, Hiroo; and Yuza, Yasutada, to S.O.C. Corporation. Chip type fuse. 4,599,596, Cl. 337-201.000.
Arimoto, Yutaka: *See—*
Misato, Tomomasa; Homma, Yasuo; Arimoto, Yutaka; Hidaka, Tohoru; and Yuda, Mitsuhara, 4,599,233, Cl. 424-127.000.
Armco Inc.: *See—*
James, Robert G., 4,599,046, Cl. 417-44.000.
Armstrong, Errol C.: *See—*
Thompson, James R.; Armstrong, Errol C.; Wipfler, Richard T.; and Rhodes, Richard O., 4,598,450, Cl. 29-157.30V.
Armstrong World Industries, Inc.: *See—*
Kauffman, William J.; Colyer, Timothy D.; and Dees, Martin, Jr., 4,599,264, Cl. 428-264.000.
Arnold, Edward J.: *See—*
Glover, John H.; Arnold, Edward J.; and Clissett, Peter A. G., 4,598,809, Cl. 192-111.00A.
Arnold, Hanfried, to Schering Aktiengesellschaft. Process for the production of 17α-acetoxy-1α,2α-methylene-4,6-pregnadiene-3,20-dione. 4,599,200, Cl. 260-239.55C.
Arvidsson, Krister, to AG Segerstrom och Svensson. Device for mounting objects intended for attachment to rims of vehicle wheels. 4,598,952, Cl. 301-37.00C.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Kawakami, Kiyoshi; Ohashi, Hiroyuki; and Katsumata, Tsutomu, 4,599,145, Cl. 203-71.000.
Ueda, Sumio; and Fukuda, Kunio, 4,599,380, Cl. 525-68.000.
Yamamizu, Takafumi; and Kawakami, Fumiaki, 4,599,175, Cl. 210-635.000.
Asai, Hiromitsu: *See—*
Furumura, Kyozaburo; Sugi, Hiromi; Murakami, Yasuo; and Asai, Hiromitsu, 4,598,914, Cl. 277-80.000.
Asao, Shunji: *See—*
Nakamura, Akira; Asao, Shunji; and Ito, Yoshiyuki, 4,598,730, Cl. 137-117.000.
Asaoka, Yoshitaka; Higuchi, Takeo; and Kuji, Yoshiharu, to Sasaki Nouki Kabushiki Kaisha. Fertilizer spreader having dispersing space formed between front end outlet and a clash part. 4,598,868, Cl. 239-659.000.
ASEA Aktiebolag: *See—*
Bergman, Carl; Holmstrom, Goran; and Nygard, Arne, 4,598,573, Cl. 72-455.000.
Ashjian, Henry: *See—*
Horodysky, Andrew G.; Kaminski, Joan M.; Ashjian, Henry; and Gawel, Henry A., 4,599,183, Cl. 252-32.70E.
Ashmead, Harvey H., to Albion Laboratories. Pure amino acid chelates. 4,599,152, Cl. 204-72.000.
AT&T Bell Laboratories: *See—*
Alavi, Kambiz; Cho, Alfred Y.; Pearsall, Thomas P.; and Temkin, Henryk, 4,599,728, Cl. 372-45.000.
Bethea, Clyde G.; Capasso, Federico; Hutchinson, Albert L.; Levine, Barry F.; and Tsang, Won-Tien, 4,599,632, Cl. 357-30.000.
Busch-Vishniac, Ilene J.; Kubli, Robert A.; and West, James E., 4,598,590, Cl. 73-724.000.
Clemons, Donald G., 4,599,709, Cl. 365-200.000.
Cornell, Ronald G.; Huensch, George D.; Shelhamer, Kenneth W.; and Warty, Pramod, 4,599,490, Cl. 179-2.0EB.
Paski, Robert M., 4,599,526, Cl. 307-269.000.
AT&T Information Systems Inc.: *See—*
Breen, Robert N.; Day, Robert A., II; Lawrence, Victor B.; and Zboray, Michael R., 4,599,719, Cl. 370-24.000.
Ateliers de Constructions Electriques de Charleroi: *See—*
Dewinck, Jean; and Hancart, Lucien, 4,598,464, Cl. 29-597.000.
Atkinson, George K. Treatment of titanium dioxide and other pigments to improve dispersibility. 4,599,114, Cl. 106-300.000.

Atlantic Richfield Company: *See*—
Bender, David L.; and Mitchell, Kim W., 4,599,154, Cl. 204-129.600.
Kesling, Haven S., Jr.; and Harris, James J., 4,599,366, Cl. 521-57.000.

Atsumi, Kinya: *See*—
Ito, Novuei; Atsumi, Kinya; Mizuno, Naohito; and Kikuchi, Tetsuro, 4,598,676, Cl. 123-145.00A.

Atwood, John; Helms, Charles; and Scott, Raymond P. W., to Perkin-Elmer Corporation, The. Sample cell temperature stabilizer. 4,598,765, Cl. 165-66.000.

Auderset, Heinrich: *See*—
Steigmeier, Edgar F.; and Auderset, Heinrich, 4,598,997, Cl. 356-237.000.

Audioplan Renate Kuhn: *See*—
Kuhn, Volker; and Kuhn, Thomas, 4,599,483, Cl. 174-36.000.

Automation Industries, Inc.: *See*—
Stephenson, Roger C., 4,598,969, Cl. 339-143.00R.

Avco Corporation: *See*—
Vasilos, Thomas, 4,599,256, Cl. 428-114.000.

Ayr Pty. Ltd.: *See*—
Smith, Bernard R., 4,599,687, Cl. 363-61.000.

B.A.T. Cigaretten-Fabriken GmbH: *See*—
Stiller, Wilfried; Ulrich, Jorn; and Sibbers, Hartwig, 4,598,721, Cl. 131-375.000.

Baader, Edward J. Fuse bus bar assembly. 4,599,679, Cl. 361-361.000.

Babcock & Wilcox Company, The: *See*—
Robertson, John W., Jr.; and Siegel, Stuart B., 4,599,550, Cl. 318-811.000.

Babu, Suryadevara V.; Hoffarth, Joseph G.; and Welsh, John A., to International Business Machines Corporation. Plasma etching with tracer. 4,599,134, Cl. 156-626.000.

Bacardi Corporation: *See*—
Benjes, Henry H.; Wahbeh, Valery N.; and Stukenberg, John R., 4,599,167, Cl. 210-150.000.
Benjes, Henry H.; Wahbeh, Valery N.; and Stukenberg, John R., 4,599,168, Cl. 210-151.000.

Bacardit, Juan S., to Bendiberica, S.A. Compact assisted steering mechanism. 4,598,629, Cl. 91-519.000.

Backus, Henricus P. Apparatus for continuous extrusion of metals. 4,598,567, Cl. 72-262.000.

Bader, Lawrence M., to Energy Systems and Service Corp. Apparatus for efficiently controlling the operation of parallel boiler units. 4,598,668, Cl. 122-448.00B.

Baghuis, Ludovicus H., to Van Mullekom Innovation B.V. Rotary blade machine with blade end sealing. 4,599,057, Cl. 418-146.000.

Bailey, Francis V., to Outboard Marine Corporation. Bonded sand sprue cup. 4,598,757, Cl. 164-137.000.

Bajwa, Balbir S., deceased (by Bajwa, Sarabjeet, Surjeet K. Bajwa, heirs); Chatterjee, Dipak K.; Ganguli, Bimal N.; Reden, Jurgen; and de Souza, Noel J., to Hoechst Aktiengesellschaft. Bisamidine derivatives of 5,10-dioxo-4,5,9,10-tetrahydro-4,9-dioxopyrenes, of 6(5H)-phenanthridones, and of phenanthridines, useful as chemotherapeutic agents. 4,599,409, Cl. 544-126.000.

Bajwa, Sarabjeet, Surjeet K. Bajwa, heirs: *See*—
Bajwa, Balbir S., deceased; Chatterjee, Dipak K.; Ganguli, Bimal N.; Reden, Jurgen; and de Souza, Noel J., 4,599,409, Cl. 544-126.000.

Baker Oil Tools, Inc.: *See*—
Stout, Gregg W., 4,598,776, Cl. 175-4.540.

Bald, Wilfried; Stoy, Erich; Rommen, Hans; and Heisterkamp, Hans-Friedrich, to SMS Schloemann-Siemag AG. Four-high roll stand with offset working rolls. 4,598,566, Cl. 72-243.000.

Baldyga, Joseph. Apparatus for crimping electric terminals. 4,598,570, Cl. 72-338.000.

Baleiko, Marc O.; and Rader, Edward F., to Standard Oil Company (Indiana). Process for recovery of methacrylic acid. 4,599,144, Cl. 203-15.000.

Bales, Thomas O.: *See*—
Arenas, Alvaro; Bales, Thomas O.; and Box, John W., 4,598,466, Cl. 29-623.200.

Ball Corporation: *See*—
Mirra, Michael J.; Headrick, Jon W.; and Giuliani, Raymond E., 4,599,279, Cl. 428-658.000.

Balzers Aktiengesellschaft: *See*—
Moll, Eberhard; and Buhl, Rainer, 4,598,663, Cl. 118-50.100.

Banitt, Elden H., to Riker Laboratories, Inc. Cyclopentanone derivatives. 4,599,434, Cl. 549-342.000.

Baran, Robert H.; Cioccio, Armand, deceased (by Cioccio, Mary Jane, personal representative); Komenda, Joseph G.; and Hawkins, Ronald B., to United States of America, Navy. Hybrid fiber optics and radio frequency telemetry apparatus for acquiring data from an underwater environment. 4,599,745, Cl. 455-612.000.

Barbella, Peter F.; and Wagner, Ronald A., to United States of America, Air Force. Radar fuze system. 4,599,616, Cl. 343-7.0PF.

Bardoliwalla, Dinshaw F.; and Grinstein, Reuben H., to Diamond Shamrock Chemicals Company. Self-inverting water-in-oil polymer emulsions having low pour point temperatures. 4,599,372, Cl. 523-336.000.

Barnabe, Jean-Pierre: *See*—
Fourrey, Francois; and Barnabe, Jean-Pierre, 4,598,947, Cl. 297-362.000.

Barnes, David A.; and Szonntagh, Eugene L., to Honeywell Inc. Thin bed sorption/desorption apparatus and method for making the same. 4,599,095, Cl. 55-208.000.

Barnes, James K.: *See*—
Barnes, Joey L.; and Barnes, James K., 4,598,530, Cl. 53-452.000.

Barnes, Joey L.; and Barnes, James K. Method of manufacturing packaging device. 4,598,530, Cl. 53-452.000.

Barnett, Edward C. W., to Thorn EMI Domestic Appliances Limited. Sifting device. 4,598,874, Cl. 241-37.500.

Barrows, Robert E., to Ingersoll-Rand Company. Lubricator. 4,598,796, Cl. 184-42.000.

Barrus, Jeffery C.: *See*—
Reitz, Christopher J.; and Barrus, Jeffery C., 4,598,962, Cl. 339-17.00L.

Barth, Merlyn; and Kosednar, Joseph. Vibration-minimizing magnetic card reader. 4,599,510, Cl. 235-449.000.

Bartsch, Gunter: *See*—
Gluck, Roland; Heilemann, Otto; and Bartsch, Gunter, 4,598,671, Cl. 123-41.310.

BASF Aktiengesellschaft: *See*—
Bronstert, Klaus; Vogel, Hans-Henning; and Rath, Hans P., 4,599,433, Cl. 549-255.000.
Dehnert, Johannes; and Junemann, Werner, 4,599,402, Cl. 534-700.000.
Dockner, Toni; Sauerwald, Manfred; Manegold, Jost H.; and Leitner, Hans, 4,599,202, Cl. 558-313.000.
Eckell, Albrecht; Elzer, Albert; Hoffmann, Gerhard; Leyrer, Reinhold J.; and Werther, Heinz-Ulrich, 4,599,293, Cl. 430-126.000.
Fischer, Rolf; Hoelderich, Wolfgang; Merger, Franz; Mross, Wolf D.; and Weitz, Hans-Martin, 4,599,458, Cl. 568-450.000.
Fuchs, Hugo, 4,599,199, Cl. 260-239.30A.
Lange, Arno; Kiehs, Karl; and Adolphi, Heinrich, 4,599,356, Cl. 514-535.000.
Loch, Werner; Schupp, Eberhard; Osterloh, Rolf; Dobbelstein, Arnold; and Ahlers, Klaas, 4,599,371, Cl. 523-402.000.
Lotsch, Wolfgang; and Henning, Georg, 4,599,113, Cl. 106-288.00Q.
Mueller, Herbert; and Reiss, Wolfgang, 4,599,466, Cl. 568-861.000.
Rentzea, Costin; Buschmann, Ernst; Meyer, Norbert; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,599,335, Cl. 514-255.000.
Seufert, Walter; Loeffler, Hans-Peter; Schirmer, Ulrich; Seppelt, Wolfgang; and Adolphi, Heinrich, 4,599,329, Cl. 514-119.000.

Bastian, Dale E., to Richmond Lox Equipment Company. Cryogenic pressure building system. 4,598,554, Cl. 62-51.000.

Bates, Herbert E.: *See*—
Jewett, David N.; Bates, Herbert E.; and Milstein, Joseph B., 4,599,132, Cl. 156-617.00H.

Bates, Stanley, to Chillcotts Limited. Exhaust silencer. 4,598,791, Cl. 181-264.000.

Baud, Jean-Pierre, to Intra-Cofor. Apparatus for determining the variations in volume of an expandable deformable cell embedded in soil and subjected to internal pressure gradients. 4,598,591, Cl. 73-784.000.

Bauer, Edmund G., to Bethlehem Steel Corporation. Method and apparatus for controlling crossflow in a double collector main coke oven battery. 4,599,140, Cl. 201-1.000.

Baugh, John L.: *See*—
Nevels, David L.; and Baugh, John L., 4,598,774, Cl. 166-382.000.

Baum, Albert. Device for securing building shafts against forcible entry or passage. 4,598,508, Cl. 52-106.000.

Baum, Frederick W. Champagne bottle opener. 4,598,613, Cl. 81-3.370.

Bauman, Therese M.; and Dietlein, John E., to Dow Corning Corporation. Water-blown silicone foam. 4,599,367, Cl. 521-71.000.

Baus, Rene , to American Magnetics Corporation. Timing wheel for card encoder. 4,598,479, Cl. 33-129.000.

Bayer Aktiengesellschaft: *See*—
Dicke, Hans-Rudolf; Schmidt, Manfred; Witman, Mark; and El-Sayed, Aziz, 4,599,395, Cl. 528-173.000.
Forster, Heinz; Eue, Ludwig; and Schmidt, Robert R., 4,599,106, Cl. 71-100.000.
Gayer, Herbert; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,599,350, Cl. 514-445.000.
Heywang, Gerhard; Reinecke, Paul; Brandes, Wilhelm; Haenssler, Gerd; and Hammann, Ingeborg, 4,599,349, Cl. 514-383.000.
Oeckl, Siegfried; Schmitt, Hans-Georg; Paulus, Wilfried; and Genth, Hermann, 4,599,427, Cl. 548-262.000.
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,599,334, Cl. 514-253.000.
Schmetzer, Johannes; Stetter, Jorg; Reinecke, Paul; and Hanssler, Gerd, 4,599,348, Cl. 514-383.000.
Schulte, Bernhard; Tischer, Werner; Kaloff, Hans; and Weber, Hans-Leo, 4,599,262, Cl. 428-215.000.
Thomas, Rudolf; Eue, Ludwig; Schmidt, Robert; and Lurssen, Klaus, 4,599,448, Cl. 564-214.000.

BBC Brown, Boveri & Company, Limited: *See*—
Lanz, Otto, 4,599,556, Cl. 324-52.000.

Bean, Kenneth E.; Havemann, Robert H.; and Lane, Andrew, to Texas Instruments Incorporated. Semiconductor processing facility for providing enhanced oxidation rate. 4,599,247, Cl. 427-93.000.

Bean, Robert M.: *See*—
Beckham, Hugh C.; and Bean, Robert M., 4,599,683, Cl. 362-166.000.

Beard, Terry D. Method and apparatus for sound track reproduction. 4,599,715, Cl. 369-124.000.

Beaudet, Didier M.; and Nicole, Pierre, to Societe Anonyme de Telecommunications. Device for stabilizing gain of a photosensitive avalanche member. 4,599,527, Cl. 307-310.000.

Bechtel International Corporation: *See*—
McGillivray, Terrence L.; and Coull, Thomas B., 4,599,014, Cl. 405-225.000.

Beckey, Thomas J., to Honeywell Inc. Refrigeration heat pump and auxiliary heating apparatus control system with switchover during low outdoor temperature. 4,598,764, Cl. 165-29.000.

Beckham, Hugh C.; and Bean, Robert M., to Coleman Company, Inc., The. Lantern with two-position globe. 4,599,683, Cl. 362-166.000.

Beckly, David E. Man overboard retrieval device. 4,599,074, Cl. 441-80.000.

Becton, Dickinson and Company: *See*—
Grimard, Jean P., 4,599,082, Cl. 604-90.000.
Lanier, Lewis; and Phillips, Joseph, 4,599,304, Cl. 435-7.000.
Saunders, Alex M.; and Chang, Chin-Hai, 4,599,307, Cl. 435-34.000.

Beecham Group Ltd.: *See*—
Hadley, Michael S.; and King, Francis D., 4,599,420, Cl. 546-124.000.

Behringwerke Aktiengesellschaft: *See*—
Bohn, Hans; and Winckler, Wilhelm, 4,599,318, Cl. 436-543.000.

Belart, Juan, to ITT Industries, Inc. Vacuum-operated brake power booster. 4,598,625, Cl. 91-369.00R.

Belart, Juan; and Burgdorf, Jochen, to ITT Industries, Inc. Slip control system master cylinder with piston sleeve. 4,598,955, Cl. 303-114.000.

Bell, Cecil R., Jr.; Lathery, Willie M.; Patel, Navin D.; and London, Jasper R., to Sara Lee Corporation. Loading system for a toe closing assembly. 4,598,817, Cl. 198-468.200.

Bell, Richard E., to AMF Incorporated. Method and apparatus for attaching leads. 4,599,588, Cl. 335-127.000.

Bell, Richard S.; and Hood, Charles T., Jr. One-handed soldering gun. 4,598,855, Cl. 228-52.000.

Bellinghausen, Joan M., to International Business Machines Corporation. Processing of gray scale image pels to facilitate data compression. 4,599,656, Cl. 358-261.000.

Beloit Corporation: *See*—
Frye, Kenneth G.; and Karis, Arthur T., 4,598,849, Cl. 226-21.000.

Belvederi, Bruno: *See*—
Mattei, Riccardo; and Belvederi, Bruno, 4,598,719, Cl. 131-84.100.

Bender, David L.; and Mitchell, Kim W., to Atlantic Richfield Company. Electrically enhanced liquid jet processing. 4,599,154, Cl. 204-129.600.

Bendiberica, S.A.: *See*—
Bacardit, Juan S., 4,598,629, Cl. 91-519.000.

Benjes, Henry H.; Wahbeh, Valery N.; and Stukenberg, John R., to Bacardi Corporation. Apparatus for treatment of waste water. 4,599,167, Cl. 210-150.000.

Benjes, Henry H.; Wahbeh, Valery N.; and Stukenberg, John R., to Bacardi Corporation. Apparatus for treatment of waste water having selective recycle control. 4,599,168, Cl. 210-151.000.

Bennett, Robert P.; and Sokolove, Robert L., to Gus, Inc. Method to improve flow characteristics of water insoluble solid particles and composition. 4,599,249, Cl. 427-220.000.

Benson, Alan C.: *See*—
Flesher, Peter; Farrar, David; and Benson, Alan C., 4,599,379, Cl. 524-801.000.

Bentin, Horst K.: *See*—
Doring, Michael; Bentin, Horst K.; and Maier, Herman F. L., 4,599,628, Cl. 346-140.00R.

Bentley, Ralph L. Hydraulic accumulator. 4,598,737, Cl. 138-30.000.

Beranek, William J., to Cordis Corporation. Torque clamp for use with pervenous lead having fixation device. 4,598,708, Cl. 128-303.00R.

Berg, Gilbert G.: *See*—
Cannady, Daniel L., Jr.; Mungin, Halbert; and Berg, Gilbert G., 4,599,127, Cl. 156-289.000.

Berger, Dirck V. Cleaning fluid vessel for immersion of cartridge-type filter media. 4,599,173, Cl. 210-451.000.

Berger, Gerald P.: *See*—
Young, Rickie A.; Willard, David L.; and Berger, Gerald P., 4,598,829, Cl. 212-149.000.

Berger, Paul L.: *See*—
Berger, Richard C.; and Berger, Paul L., 4,598,503, Cl. 52-27.000.

Berger, Richard C.; and Berger, Paul L. Vibration absorption mounting for a rooftop air handling unit or the like (II). 4,598,503, Cl. 52-27.000.

Bergman, Carl; Holmstrom, Goran; and Nygard, Arne, to ASEA Aktiebolag. Method of forming an object by pressing a blank in a press. 4,598,573, Cl. 72-455.000.

Berkowitz, Nathan L. Cylinder lock. 4,598,563, Cl. 70-364.00R.

Berman, Ari P., to Data Translations, Inc. Continuous data transfer system. 4,599,689, Cl. 364-200.000.

Bernard, Patrick, to Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux Efcis. Broad-band differential amplifier with double reverse feed-back of common mode. 4,599,575, Cl. 330-258.000.

Bernstein, Seymour: *See*—
Conrow, Ransom B.; and Bernstein, Seymour, 4,599,203, Cl. 260-506.000.
Poletto, John F.; and Bernstein, Seymour, 4,599,204, Cl. 260-507.00R.

Berte', Ferruccio; Marciandi, Franco; and Binaghi, Marco, to Montedison S.p.A. Flameproof polymeric compositions containing acid piperazine pyrophosphate. 4,599,375, Cl. 524-100.000.

Bertele, Giovanni M.: *See*—
Pollini, Piero; Bertele, Giovanni M.; and Comoli, Ettore, 4,599,072, Cl. 441-65.000.

Bertele, Giovanni Marco: *See*—
Pollini, Piero; Bertele, Giovanni M.; and Comoli, Ettore, 4,599,072, Cl. 441-65.000.

Bertelli, Alberto, to Sigma Tau Industrie Faramaceutiche Riunite S.p.A. Pharmaceutical composition with metabolic and energetic activity for the use in cardiac and vascular therapy. 4,599,232, Cl. 424-94.000.

Berthiez-Saint-Etienne: *See*—
Poincenot, Rene , 4,599,023, Cl. 409-233.000.

Bertram, Dieter: *See*—
Dautzenberg, Horst; Loth, Fritz; Borrmeister, Bodo; Bertram, Dieter; Lettau, Herbert; Stamberg, Jiri; and Peska, Jan, 4,599,209, Cl. 264-7.000.

Beteille, Roger H., to Airbus Industrie. Fixed-wing aircraft with tandem supporting surfaces. 4,598,888, Cl. 244-76.00R.

Bethea, Clyde G.; Capasso, Federico; Hutchinson, Albert L.; Levine, Barry F.; and Tsang, Won-Tien, to AT&T Bell Laboratories. Photodetector with graded bandgap region. 4,599,632, Cl. 357-30.000.

Bethlehem Steel Corporation: *See*—
Bauer, Edmund G., 4,599,140, Cl. 201-1.000.

BICC Public Limited Company: *See*—
White, Cyril J.; and Joyce, Christopher, 4,598,963, Cl. 339-17.00C.

Biedess, Frederick F., to National Bullet Proof, Inc. Shrapnel proof door frame. 4,598,647, Cl. 109-77.000.

Bierig, Robert W.: *See*—
Vorhaus, James L.; Bierig, Robert W.; and Pucel, Robert A., 4,599,585, Cl. 333-164.000.

Bilbao-Eguiguren, Jesua M.; and Garin de Lazcano, Jose I. Process for making bimetallic seamless tubing of steel or special alloys for extrusion. 4,598,856, Cl. 228-131.000.

Bilharz, Oscar W., to United States of America, Energy. Low frequency AC waveform generator. 4,599,703, Cl. 364-851.000.

Billig, Ernst; Abatjoglou, Anthony G.; Bryant, David R.; Murray, Rex E.; Mather, John M.; and Hsu, Song K. Rotary compressor with non-pressure angle. 4,599,059, Cl. 418-236.000.

Billig, Ernst; Abatjoglou, Anthony G.; Bryant, David R.; Murray, Rex E.; and Mather, John M., to Union Carbide Corporation. Transition metal complex catalyzed reactions. 4,599,206, Cl. 558-85.000.

Binaghi, Marco: *See*—
Berte', Ferruccio; Marciandi, Franco; and Binaghi, Marco, 4,599,375, Cl. 524-100.000.

Bingham, Grady A., to Thermal Concepts, Inc. Heat pump and method. 4,598,558, Cl. 62-324.100.

Bishop, Paul W.: *See*—
Jarinko, Philip A.; Schuitemaker, Frans; and Bishop, Paul W., 4,598,864, Cl. 239-152.000.

Bisping, Bernhard: *See*—
Romer, Rudolf; Simon, Walter; Boecker, Jurgen; and Bisping, Bernhard, 4,598,644, Cl. 102-521.000.

Bito, Laszlo Z., to Columbia University in the City of New York, The Trustees of. Use of eicosanoids and their derivatives for treatment of ocular hypertension and glaucoma. 4,599,353, Cl. 514-530.000.

Blaak, Cornelis, to Stork Brabant. Foam generator. 4,599,208, Cl. 261-83.000.

Black & Decker Inc.: *See*—
Verdier, Alain; and Polly, Marc, 4,599,529, Cl. 310-50.000.
Winston, Walter E., 4,599,009, Cl. 401-197.000.

Blackburn, Keith: *See*—
Lee, Andrew O.; Muehlbauer, Heinz A.; and Blackburn, Keith, 4,599,091, Cl. 44-11.000.

Blackshaw, Andrew L.: *See*—
Robinson, Glen P.; and Blackshaw, Andrew L., 4,598,557, Cl. 62-238.600.

Blanchard, William C., to Allied Corporation. Personal liquid chemical agent detector. 4,599,609, Cl. 342-602.000.

Blank, Wilhelm; Roth, Ernst; and Tellbach, Reinhard, to Klein, Schanzlin & Becker Aktiengesellschaft. Cable gland. 4,599,487, Cl. 174-151.000.

Bleistahl G.m.b.H.: *See*—
Kohler, Michael; and Petry, Wolfgang, 4,599,110, Cl. 75-243.000.

Bluestein, Ben A., to General Electric Co. Solvent resistant vulcanizable silicone rubber compositions made with fluorosilicone hydride cross linking agents. 4,599,374, Cl. 523-213.000.

Blytas, George C., to Shell Oil Company. Recovery of glycerine from saline waters. 4,599,178, Cl. 210-737.000.

Bock, Jan: *See*—
Cargle, Virgil H.; Robbins, Max L.; and Bock, Jan, 4,599,250, Cl. 427-220.000.

Boden, Richard M.: *See*—
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Boeing Company, The: *See*—
Anglin, Jeanne M.; Edwards, Richard R.; and Thomas, John E., 4,599,255, Cl. 428-73.000.
Friebel, Gottfried O.; and Kulfan, Robert M., 4,598,886, Cl. 244-15.000.
Herzog, Hans K.; and Sakurai, Seiya, 4,598,890, Cl. 244-230.000.
Woods, Quentin T., 4,599,018, Cl. 408-1.00R.

Boenig, Heinrich J., to United States of America, Energy. Superconducting magnetic energy storage for asynchronous electrical systems. 4,599,519, Cl. 307-22.000.

Bohn, Hans; and Winckler, Wilhelm, to Behringwerke Aktiengesellschaft. Tissue protein PP_{19}, a process for obtaining it, and its use. 4,599,318, Cl. 436-543.000.

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Boland, Lawrence J., to International Business Machines Corporation. Non-shorting pin system. 4,598,966, Cl. 339-75.0MP.

Bolt Technology Corporation: *See*—
Chelminski, Stephen V., 4,599,712, Cl. 367-144.000.
Bolton, Ivor W., to International Business Machines Corporation. Control of relative humidity in machine enclosures. 4,599,670, Cl. 360-137.000.
Bons, Antonie; and Raabe, Erwin, to Stephan-Werke GmbH. Universal machine for wood and/or synthetic plastic working. 4,598,744, Cl. 144-1.00G.
Bordoni, Maurice E.; and Lieberman, Ephraim, to Cadema Medical Products, Inc. Aerosol inhalation device. 4,598,704, Cl. 128-200.140.
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Towers, James A.; and Krueger, Robert H., 4,599,185, Cl. 252-68.000.
Boris, Alfred; Partridge, John J.; and Uskokovic, Milan R., to Hoffmann-La Roche Inc. Method of treating milk fever. 4,599,330, Cl. 514-167.000.
Borodulin, German; Shkolnik, Alexander; and Persidsky, Maxim. Opener and stopper for crimped and threaded bottle caps. 4,598,435, Cl. 7-156.000.
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Borsuk, Alvin; Mally, Timothy G.; and Rattmann, James A., to Oscar Mayer Foods Corporation. Stacker assembly. 4,599,025, Cl. 414-82.000.
Bosma, Marcel A. R.: *See*—
van der Stoel, Roland E.; and Bosma, Marcel A. R., 4,599,421, Cl. 546-251.000.
Bosone, Enrico; Caprara, Giuseppe; Corda, Francesco; Gozzo, Franco; Menconi, Augusto; Piccardi, Paolo; and Caprioli, Vincenzo, to Montedison, S.p.A. Pyrethroids. 4,599,358, Cl. 514-521.000.
Boss, Hans; Pfister, Jurg, deceased; and by Pfister, Lisa, administrator. Coupling device for making a permanent pipe connection. 4,598,938, Cl. 285-382.200.
Bossenmaier, Alban: *See*—
Scholz, Hans-Jurgen; Brambilla, Luigi; Katz, Egon; Bossenmaier, Alban; and Zweigart, Gerhard, 4,598,943, Cl. 296-97.00H.
Bourgeois, Claude: *See*—
Demay, Claude; and Bourgeois, Claude, 4,599,323, Cl. 502-161.000.
Bower, David E.: *See*—
Dwyer, Douglas F. G.; and Bower, David E., 4,598,587, Cl. 73-517.00R.
Bower, Esther A.; and Rafalko, Joseph J., to Celanese Corporation. Process for modifying polybenzimidazole polymers with ethylene carbonates. 4,599,388, Cl. 525-433.000.
Bowker, Roger S.; Olsen, Linda J.; and Hines, Jesse M., to Digital Equipment Corporation. Interactive computer-based information display system. 4,599,611, Cl. 340-721.000.
Box, John W.: *See*—
Arenas, Alvaro; Bales, Thomas O.; and Box, John W., 4,598,466, Cl. 29-623.200.
Boxenhorn, Burton, to Charles Stark Draper Laboratory, Inc., The. Planar inertial sensor. 4,598,585, Cl. 73-505.000.
Bracht, Rodger R.; and Verboom, Johannes J., to Optical Storage International - U.S. Direct read after write verify using differential detection. 4,599,717, Cl. 369-54.000.
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Kuchler, Fritz, 4,598,618, Cl. 83-77.000.
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Bramwell, David W., to EGA Limited. Box for electrical components. 4,599,484, Cl. 174-52.00R.
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Gayer, Herbert; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,599,350, Cl. 514-445.000.
Heywang, Gerhard; Reinecke, Paul; Brandes, Wilhelm; Haenssler, Gerd; and Hammann, Ingeborg, 4,599,349, Cl. 514-383.000.
Brands, Karl D.: *See*—
Wuhrmann, Juan C.; Brands, Karl D.; Mueller, Heinz; Schumann, Klaus; and Altenschoepfer, Theodor, 4,599,189, Cl. 252-174.150.
Braun Aktiengesellschaft: *See*—
Schiebelhuth, Heinz; Franke, Wolfgang; Kahlcke, Hartwig; and Oppermann, Gunter, 4,599,003, Cl. 366-241.000.
Braun, Eugene R.: *See*—
Nellums, Richard A.; Braun, Eugene R.; and Holtzhauser, Joseph C., 4,598,609, Cl. 74-650.000.
Bree, Charles E., to D. L. Auld Company, The. Method for making decorative emblems and the like and shapes prepared by that method. 4,599,253, Cl. 428-40.000.
Breen, Robert N.; Day, Robert A., II; Lawrence, Victor B.; and Zboray, Michael R., to AT&T Information Systems Inc. Full duplex data set with half-duplex emulation. 4,599,719, Cl. 370-24.000.
Breeze, Alan G.: *See*—
Colquhoun, Howard M.; and Breeze, Alan G., 4,599,452, Cl. 568-319.000.
Breit, Henry F., to Texas Instruments Incorporated. Process for producing reinforced structural articles and articles produced thereby. 4,598,473, Cl. 29-855.000.
Brekke, Carroll E., to FMC Corporation. Quick connect diagnostic system. 4,598,581, Cl. 73-117.300.
Brennen, Michael B.; and Sarkozi, Miklos, to Westinghouse Electric Corp. Malfunction detector for static VAR controllers. 4,599,553, Cl. 323-205.000.
Brewer, Barney J. Convertible poncho. 4,598,725, Cl. 135-95.000.
Brewer, G. Daniel, to United States of America, Air Force. Variable cycle engine for high altitude aircraft. 4,598,543, Cl. 60-39.161.
Bricaud, Herve ; Rouffy, Jean C.; and L'Henaff, Patrick, to Socapex. Connector and closure clip for a rectangular circuit support. 4,598,965, Cl. 339-75.0MP.
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Maggioni, Paolo; Minisci, Francesco; and Correale, Mariano, 4,599,461, Cl. 568-652.000.
Bridgestone Corporation: *See*—
Manabe, Masahiro; Nagafuchi, Eiichi; and Nohara, Yoshio, 4,599,061, Cl. 425-41.000.
Briggs, E. L. Combustion inhibiting construction of a welt cord. 4,598,622, Cl. 87-6.000.
Bright, John H., to American Cyanamid Company. Selective extraction of rhenium from aqueous sulfuric acid solutions. 4,599,153, Cl. 204-105.00R.
Briskin Manufacturing Company: *See*—
Franke, Eric; Kerber, Robert; and Langley, Marion D., 4,598,854, Cl. 228-48.000.
Brisland, Michael J. Fluid motors. 4,598,627, Cl. 91-477.000.
Bristol-Myers Company: *See*—
Matson, James A.; and Bush, James A., 4,599,310, Cl. 435-71.000.
British-American Tobacco Company Limited: *See*—
Stewart-Cox, Adrian R.; and Bryant, Robert G., 4,599,699, Cl. 364-552.000.
British Petroleum Company P.L.C., The: *See*—
Gregory, Reginald; and Westlake, David J., 4,599,470, Cl. 585-323.000.
British Steel Corporation: *See*—
Jowitt, Raymond; and Abell, Ian D., 4,598,577, Cl. 73-23.000.
Brock Manufacturing Company: *See*—
Van Daele, Antoine, 4,598,496, Cl. 49-357.000.
Brode, George L.: *See*—
Fan, You-Ling; Brode, George L.; and Rosen, Meyer R., 4,599,390, Cl. 526-240.000.
Bronson, Larry D.; and Couperus, Egbert, to Allis-Chalmers Corporation. Portable crushing and screening plant. 4,598,875, Cl. 241-78.000.
Bronstert, Klaus; Vogel, Hans-Henning; and Rath, Hans P., to BASF Aktiengesellschaft. Reaction of olefins with maleic anhydride. 4,599,433, Cl. 549-255.000.
Brooker, Arnold S.; and Schnackel, Jay F., to Plasmafusion, Inc. Refractory slidegate with countersunk hole and method. 4,599,242, Cl. 427-34.000.
Brotz, Gregory R. Method of producing a wrapped continuous length structure. 4,598,755, Cl. 164-5.000.
Brown, Phillip H.; and Spector, George. Automatic bean sheller. 4,598,637, Cl. 99-580.000.
Brown, Raymond E.; Dillard, Homer E.; Green, James W.; and McIntosh, Stuart A., to McDonnell Douglas Corporation. System for image generation. 4,599,645, Cl. 358-104.000.
Brown, Thomas J. Mobius capacitor. 4,599,586, Cl. 333-172.000.
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Brownlow, James M.; and Rosenberg, Robert, to International Business Machines Corp. Control of the sintering of powdered metals. 4,599,277, Cl. 428-552.000.
Bruno, Charles F.: *See*—
Kumar, Sampath, 4,599,403, Cl. 536-18.100.
Brush Wellman Inc.: *See*—
Church, Nathan L.; Cribb, W. Raymond; and Harkness, John C., 4,599,120, Cl. 148-414.000.
Brutel, Jean-Pierre; Leray, Yvon; and Quey, Louis, to Rhone-Poulenc Fibres. Perforated core for a textile yarn package. 4,598,880, Cl. 242-164.000.
Bruzzese, Tiberio; Dell'Acqua, Ernani; Ottoni, Franco; and van den Heuvel, Holger H., to SPA-Societa Prodotti Antibiotici spa. Process for preparing 2-methyl-N-(2-pyridyl)-2H-1,2-benzothiazine-3-carboxamide 1,1-dioxide derivatives and intermediates therefor. 4,599,406, Cl. 544-49.000.
Bryan, Philip S.: *See*—
Reczek, James A.; Ponticello, Ignazio S.; and Bryan, Philip S., 4,599,389, Cl. 526-265.000.
Bryant, David R.: *See*—
Billig, Ernst; Abatjoglou, Anthony G.; Bryant, David R.; Murray, Rex E.; Mather, John M.; and Hsu, Song K., 4,599,059, Cl. 418-236.000.
Billig, Ernst; Abatjoglou, Anthony G.; Bryant, David R.; Murray, Rex E.; and Mather, John M., 4,599,206, Cl. 558-85.000.
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Buck, Byron L. Method and system for forming sheet material into apertured shapes. 4,599,125, Cl. 156-248.000.
Buddell, Robin L.; Oswald, Audrey M.; and Lagarde, William A., to Shell Oil Company. Sequential cracking of hydrocarbons. 4,599,480, Cl. 585-650.000.
Buglione, Arthur J.: *See*—
Aposchanski, Alexander; Buglione, Arthur J.; Coats, James M.; and Edelman, Brian S., 4,599,694, Cl. 364-431.050.
Buhl, Rainer: *See*—
Moll, Eberhard; and Buhl, Rainer, 4,598,663, Cl. 118-50.100.
Buhler-Miag GmbH: *See*—
Russemeyer, Hans; Pollak, Karl-Heinz; and Hoffmann, Gerhard, 4,599,017, Cl. 406-95.000.

Bulard, Ronald A.: *See*—
Rohrer, Michael D.; and Bulard, Ronald A., 4,599,216, Cl. 422-21.000.

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Thoma, Martin; and Bunger, Paul, 4,599,148, Cl. 204-16.000.

Burcher, Friedrich. Strip-wound hose. 4,598,739, Cl. 138-135.000.

Burg, Donald E. Snap-in cartridge diluter. 4,598,840, Cl. 222-135.000.

Burgdorf, Jochen: *See*—
Belart, Juan; and Burgdorf, Jochen, 4,598,955, Cl. 303-114.000.

Burke, Michael A.; and Stol, Israel, to Westinghouse Electric Corp. Visual observation of welding operation. 4,599,506, Cl. 219-130.010.

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Busch-Vishniac, Ilene J.; Kubli, Robert A.; and West, James E., to AT&T Bell Laboratories. Electret transducer for blood pressure measurement. 4,598,590, Cl. 73-724.000.

Buschle, Richard D. Sharpener press-button. 4,598,478, Cl. 30-457.000.

Buschmann, Ernst: *See*—
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Matson, James A.; and Bush, James A., 4,599,310, Cl. 435-71.000.

Bushaw, Bruce A., to United States of America, Energy. Laser induced phosphorescence uranium analysis. 4,599,512, Cl. 250-253.000.

Bussard, Anne B.; and Hutchison, Wanda S., to International Telephone and Telegraph Corporation. Multiple fiber linear array and method of making same. 4,598,975, Cl. 350-96.240.

Butts, Lawrence D.: *See*—
Krupicka, William A.; Butts, Lawrence D.; and Lampley, Sidney J., 4,598,939, Cl. 292-92.000.

B.V. Briefhouder- en Papierwarenfabriek PAS: *See*—
Verholt, Johannes M., 4,598,958, Cl. 312-189.000.

BWP Controls: *See*—
Glover, John H.; Arnold, Edward J.; and Clissett, Peter A. G., 4,598,809, Cl. 192-111.00A.

Byers, Jim D.: *See*—
Cymbaluk, Ted H.; Byers, Jim D.; and Johnson, Marvin M., 4,599,469, Cl. 570-193.000.

Cable, Arthur P. Radiographic examination system. 4,599,740, Cl. 378-57.000.

Cadema Medical Products, Inc.: *See*—
Bordoni, Maurice E.; and Lieberman, Ephraim, 4,598,704, Cl. 128-200.140.

Cahen, Raymond M.: *See*—
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Cajthaml, Peter, Jr.; and Hunter, James R., to Pfizer Inc. Exhausting gas from a metal assembly. 4,598,859, Cl. 228-185.000.

Calamani, Sergio; and Turri, Eugenio, to Savio & C. S.p.A. Device for the transfer of collants and the like to a relevant sewing machine and drawing device. 4,598,656, Cl. 112-121.120.

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Haltof, Garry P.; Stephens, Eugene S.; and Czubachowski, Zygmunt J., 4,598,498, Cl. 49-407.000.

Camco, Incorporated: *See*—
Pringle, Ronald E., 4,598,773, Cl. 166-373.000.

Cammack, Michael A.; and Smith, David W., to Teledyne Industries, Inc. Showerhead. 4,598,866, Cl. 239-447.000.

Campbell Design Group, Inc.: *See*—
Labarile, Paul, 4,598,495, Cl. 49-41.000.

Campos, Francis; and Herbelleau, Yves, to Compagnie Generale des Etablissements Michelin. Reduction of the travel noise of tires. 4,598,748, Cl. 152-209.00R.

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Harvey, Debra A.; Kean, Walter F.; and Lock, Colin J. L., 4,599,436, Cl. 556-114.000.
Robinson, Barton R.; and Tanney, John W., 4,598,578, Cl. 73-32.00R.

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Mortimer, Brian C., 4,599,722, Cl. 371-37.000.

Cann, Jeffrey: *See*—
LaBarbara, A. Franklin; Cann, Jeffrey; and Evans, Carey, 4,598,821, Cl. 206-329.000.

Cannady, Daniel L., Jr.; Mungin, Halbert; and Berg, Gilbert G., to Westinghouse Electric Corp. Process for producing high gloss laminates using a vapor barrier at each end of a laminate assembly. 4,599,127, Cl. 156-289.000.

Canon Kabushiki Kaisha: *See*—
Endo, Kiyonobu, 4,599,714, Cl. 369-13.000.
Kinoshita, Takao; Tojo, Akihiko; Takayama, Tsutomu; Kaji, Toshio; and Tanaka, Nobuyoshi, 4,599,657, Cl. 358-335.000.
Kozuki, Susumu; Takimoto, Hiroyuki; Edakubo, Hiroo; and Takayama, Nobutoshi, 4,599,660, Cl. 360-77.000.
Matsumoto, Tohru; and Yamazaki, Masuo, 4,599,294, Cl. 430-137.000.
Mizutani, Morikazu; Onoda, Shigeyoshi; Nomura, Akihiro; Kanemitsu, Shinji; and Toriumi, Mototada, 4,598,993, Cl. 355-3.00R.
Sakai, Shinji; Ishizaki, Akira; and Kawabata, Takashi, 4,599,603, Cl. 340-347.0AD.
Suematsu, Koushi; Hasegawa, Tetsuo; and Osaki, Ichiro, 4,599,289, Cl. 430-98.000.
Terasawa, Koji; Miyakawa, Akira; and Kiyohara, Takehiko, 4,599,625, Cl. 346-140.00R.
Tomosada, Masahiro; Maeshima, Katsuyoshi; Inuzuka, Tsuneki; and Sakamaki, Hisashi, 4,598,994, Cl. 355-14.00R.
Yamada, Yasuyoshi, 4,599,000, Cl. 356-401.000.
Yokoyama, Yasumasa; Komori, Tomoko; Eida, Tsuyoshi; Koike, Shoji; and Kobayashi, Masatsune, 4,599,112, Cl. 106-22.000.

Capasso, Federico: *See*—
Bethea, Clyde G.; Capasso, Federico; Hutchinson, Albert L.; Levine, Barry F.; and Tsang, Won-Tien, 4,599,632, Cl. 357-30.000.

Capp, Ronald J.: *See*—
Feiber, Wolfgang E. A.; Capp, Ronald J.; and Griffin, Dwight A., 4,599,026, Cl. 414-126.000.

Caprara, Giuseppe: *See*—
Bosone, Enrico; Caprara, Giuseppe; Corda, Francesco; Gozzo, Franco; Menconi, Augusto; Piccardi, Paolo; and Caprioli, Vincenzo, 4,599,358, Cl. 514-521.000.

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Bosone, Enrico; Caprara, Giuseppe; Corda, Francesco; Gozzo, Franco; Menconi, Augusto; Piccardi, Paolo; and Caprioli, Vincenzo, 4,599,358, Cl. 514-521.000.

Cargile, William P., to Gordian Systems, Inc. Solid state key for controlling access to computer software. 4,599,489, Cl. 178-22.080.

Cargill Detroit Corporation: *See*—
Colburn, Michael D., 4,599,020, Cl. 408-211.000.

Cargle, Virgil H.; Robbins, Max L.; and Bock, Jan, to Exxon Research & Engineering Co. Freeze conditioning agent for particulate solids. 4,599,250, Cl. 427-220.000.

Carl-Zeiss-Stiftung: *See*—
Machler, Meinrad; Machler, Sibylle; and Sachse, Richard, 4,598,715, Cl. 128-634.000.

Carlson, Dana P.; Kerbow, Dewey L.; Leck, Thomas J.; and Olson, Allan H., to Du Pont de Nemours, E. I., and Company. Heat stable tetrafluoroethylene-perfluoro(alkyl vinyl ether) copolymers. 4,599,386, Cl. 525-326.200.

Carlson, David J., to RCA Corporation. Dual channel IF TV receiver with AFT derived from the picture carrier in the sound channel. 4,599,652, Cl. 358-195.100.

Carpano et Pons: *See*—
Monie, Jean, 4,598,607, Cl. 74-568.00T.

Carrier Corporation: *See*—
Tomayko, Edward A.; and Pandeya, Prakash N., 4,598,559, Cl. 62-324.600.

Carroll, Michael W.; and Harwood, Michael E., to North American Agricultural, Inc. Method and apparatus for making grain bin flooring. 4,598,569, Cl. 72-325.000.

Carson, Matthew; Le Mahieu, Ronald A.; Nason, William C.; and Tilley, Jefferson W., to Hoffmann-La Roche Inc. Derivatives of (E)-3-(4-oxo-4H-quinazolin-3-yl)-2-propenamide. 4,599,336, Cl. 514-259.000.

Carter, Lisa Tippen: *See*—
Tippen, Lesley T., 4,598,783, Cl. 180-9.320.

Casco Products Inc.: *See*—
Lupoli, Peter J.; Mattis, Donald J.; and Miller, Robert S., 4,598,686, Cl. 123-519.000.

Cashel, Mary E. Reversible book having cover-connecting insert. 4,598,934, Cl. 281-5.000.

Castellano, Anthony J., Jr.; DiStefano, Thomas H.; and Olyha, Robert S., Jr., to IBM. Photovoltaic imaging for large area semiconductors. 4,599,558, Cl. 324-158.00R.

Castelli, Vincent J.: *See*—
Kimmel, Albert L.; Chappelow, Cecil C., Jr.; and Castelli, Vincent J., 4,599,368, Cl. 523-122.000.

Castleton, Thomas E. Rafter cutting template and tape. 4,598,482, Cl. 33-482.000.

Caterpillar Mitsubishi Ltd.: *See*—
Nakamura, Akira; Asao, Shunji; and Ito, Yoshiyuki, 4,598,730, Cl. 137-117.000.

Cave, Ellis K., to TBS International, Inc. Multi-line telephone control system. 4,599,493, Cl. 179-18.0FH.

CCI Industries: *See*—
Van Horn, William E., II, 4,598,634, Cl. 99-340.000.

CDF Chimie Specialites: *See*—
Demay, Claude; and Bourgeois, Claude, 4,599,323, Cl. 502-161.000.

Celanese Corporation: *See*—
Bower, Esther A.; and Rafalko, Joseph J., 4,599,388, Cl. 525-433.000.

Century Electric, Inc.: *See*—
Phillips, Graham R.; and Nguyen, Vietson M., 4,599,552, Cl. 322-28.000.

Cestaro, Victor L. Logic probe. 4,599,557, Cl. 324-133.000.

Chambers, William: *See*—
Sloan, Frederick; and Chambers, William, 4,598,740, Cl. 140-124.000.

Chambers, William R., to Neff Instrument Corporation. Selectable gain instrumentation amplifier. 4,599,574, Cl. 330-254.000.

Chan, David C. K., to Chevron Research Company. Fungicidal 3-(N-acyl-N-arylamino) lactones. 4,599,351, Cl. 314-472.000.

Chan, Fred N.; and Nilsen, Frank C., to Ford Aerospace & Communications Corporation. Digital PWPF three axis spacecraft attitude control. 4,599,697, Cl. 364-434.000.

Chan, Ka-Kong; Holland, George W.; and Rosen, Perry, to Hoffmann-La Roche Inc. Unsaturated eicosanoic acids. 4,599,443, Cl. 560-219.000.

Chan, Tsiu C.: *See*—
Han, Yu-Pin; and Chan, Tsiu C., 4,599,118, Cl. 148-1.500.

Chandrasekhar, Hosekere S., to RCA Corporation. Method for making semiconductor device with integral fuse. 4,598,462, Cl. 29-577.00C.

Chang, Chin-Hai: *See—*
Saunders, Alex M.; and Chang, Chin-Hai, 4,599,307, Cl. 435-34.000.

Chao, Hung-Ya, to Moore Business Forms, Inc. Microencapsulation of polyisocyanates by interchange of multiple. 4,599,271, Cl. 428-402.210.

Chapman, Nicholas, to Fencemender Corp. Single bracket support and method. 4,598,512, Cl. 52-165.000.

Chappell, Gilmore H. Automatic derailleur shifter. 4,599,079, Cl. 474-80.000.

Chappelow, Cecil C., Jr.: *See—*
Kimmel, Albert L.; Chappelow, Cecil C., Jr.; and Castelli, Vincent J., 4,599,368, Cl. 523-122.000.

Charles, Jean-Michel; and Roulland, Jean-Paul, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Process for pre-concentration treatment of food by-products and installation for carrying same. 4,599,164, Cl. 210-86.000.

Charles Stark Draper Laboratory, Inc., The: *See—*
Boxenhorn, Burton, 4,598,585, Cl. 73-505.000.

Charte, Vincent J.: *See—*
Gradeff, Peter S.; and Charte, Vincent J., 4,599,201, Cl. 260-414.000.

Chatterjee, Dipak K.: *See—*
Bajwa, Balbir S., deceased; Chatterjee, Dipak K.; Ganguli, Bimal N.; Reden, Jurgen; and de Souza, Noel J., 4,599,409, Cl. 544-126.000.

Chellis, Leroy N., to International Business Machines Corporation. Product containing an epoxy composition. 4,599,268, Cl. 428-394.000.

Chelminski, Stephen V., to Bolt Technology Corporation. Modular airgun array method, apparatus and system. 4,599,712, Cl. 367-144.000.

Chen, William K. W., to International Microporous Technology, Inc. Drum coagulator for preparing microporous membranes. 4,598,662, Cl. 118-34.000.

Cheng, Wen-Chang. Foundation of the handrail. 4,598,524, Cl. 52-708.000.

Chevallet, Jacques, to Hospal Industrie. Single-needle artificial kidney. 4,599,165, Cl. 210-87.000.

Chevron Research Company: *See—*
Chan, David C. K., 4,599,351, Cl. 314-472.000.
Demaison, Gerard J.; and Kaplan, Isaac R., 4,599,218, Cl. 422-61.000.
Devries, Louis; and Ryason, P. R., 4,599,474, Cl. 585-415.000.
Kurkov, Victor P., 4,599,399, Cl. 528-313.000.
Rainis, Andrew, 4,599,321, Cl. 502-8.000.

Chillcotts Limited: *See—*
Bates, Stanley, 4,598,791, Cl. 181-264.000.

Chinnery, Lindsay C. Sailboard with removable floats. 4,598,659, Cl. 114-39.000.

Chino Works, Ltd.: *See—*
Hishikari, Isao; and Ide, Toshihiko, 4,599,507, Cl. 219-486.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See—*
Foggassy, Elemer; Faigl, Ferenc; Soos, Rudolf; and Rakoczi, Jozsef, 4,599,444, Cl. 562-401.000.
Gonczi, Csaba; Korbonits, Dezso ; Palosi, Endre; Kiss, Pal; Heja, Gergely; Kun, Judit; Szomor nee Wundele, Maria; Szvoboda nee Kanzel, Ida; Marvanyos, Ede; Horvath, Karoly; Kovacs nee Mindler, Vera; and Nagy nee Koranyi, Livia, 4,599,428, Cl. 548-306.000.
Nogradi, Mihaly; Korbonits, Dezso ; Gottsegen, Agnes; Antus, Sandor; Furst, Zsuzsa; Knoll, Jozsef; Szejtli, Jozsef; Stadler, Agnes; Kovacs, Gabor; and Marmarosi, Katalin, 4,599,327, Cl. 514-58.000.

Chinone, Naoki: *See—*
Sasaki, Yoshimitsu; Kajimura, Takashi; Chinone, Naoki; and Nakamura, Michiharu, 4,599,729, Cl. 372-49.000.

Chisari, Frank V.: *See—*
Milich, David R.; and Chisari, Frank V., 4,599,230, Cl. 424-89.000.
Milich, David R.; and Chisari, Frank V., 4,599,231, Cl. 424-89.000.

Cho, Alfred Y.: *See—*
Alavi, Kambiz; Cho, Alfred Y.; Pearsall, Thomas P.; and Temkin, Henryk, 4,599,728, Cl. 372-45.000.

Cho, Boong Y., to AccuRay Corporation. Isotopic radiation method and apparatus for measuring the resinous binder applied to a mat of glass fibers. 4,599,514, Cl. 250-359.100.

Chorkey, William J. Solenoid operated valve with balancing means. 4,598,736, Cl. 137-625.650.

Choy, Clement K.; and Keen, Frederick I., to Clorox Company, The. Thickened aqueous abrasive scouring cleanser. 4,599,186, Cl. 252-102.000.

Christensson, Od W., to Esselte PAC Aktiebolag. Method and apparatus for manufacturing a container having an inner end closure. 4,599,123, Cl. 156-69.000.

Christini, James N.: *See—*
Douglas, Alan D.; Reilly, Kenneth T.; MacInnis, Martin B.; Powers, John A.; and Christini, James N., 4,599,223, Cl. 423-49.000.

Chrysler Corporation: *See—*
Wilcox, Harry E., 4,599,500, Cl. 200-61.540.

Church, Nathan L.; Cribb, W. Raymond; and Harkness, John C., to Brush Wellman Inc. Processing of copper alloys. 4,599,120, Cl. 148-414.000.

Ciba-Geigy Corporation: *See—*
Stanton, James L.; and Gruenfeld, Norbert, 4,599,357, Cl. 514-419.000.

Cioccio, Armand, deceased: *See—*
Baran, Robert H.; Cioccio, Armand, deceased; Komenda, Joseph G.; and Hawkins, Ronald B., 4,599,745, Cl. 455-612.000.

Cioccio, Mary Jane, personal representative: *See—*
Baran, Robert H.; Cioccio, Armand, deceased; Komenda, Joseph G.; and Hawkins, Ronald B., 4,599,745, Cl. 455-612.000.

Claas OHG: *See—*
Glaubitz, Franz; Eis, Gunter; and Fromme, Werner, 4,598,718, Cl. 130-27.0AE.

Clamser, Christian J.; and Powers, Robert A., to Foster Wheeler Energy Corporation. Solid fuel feed system for a boiler. 4,598,670, Cl. 122-449.000.

Clare, Inc.: *See—*
Smith, Margaret M.; and Smith, David C., 4,598,709, Cl. 128-303.180.

Clarion Co., Ltd.: *See—*
Okamoto, Takeshi; and Minagawa, Shoichi, 4,599,532, Cl. 310-313.00D.

Clark, C. Frederick, Jr.: *See—*
Lawless, William N.; and Clark, C. Frederick, Jr., 4,599,677, Cl. 361-321.000.

Clark Equipment Company: *See—*
Schultz, Donald L., 4,598,797, Cl. 187-9.00E.

Clark, G. Keith. Spare tire carrier. 4,598,848, Cl. 224-42.240.

Clarke, John: *See—*
King, Robin C. M.; Esterson, Maurice; and Clarke, John, 4,599,542, Cl. 315-59.000.

Clayton, Anthony B.; and Kramer, Brian D., to Hercules Incorporated. Maleic modified butene copolymers. 4,599,385, Cl. 525-285.000.

Cleemann, Jorgen, to F. L. Smidth & Co. A/S. Method of manufacturing a pumpable coal/liquid mixture. 4,598,873, Cl. 241-21.000.

Clegg, John E. Revolving saucepan turntable. 4,598,635, Cl. 99-348.000.

Clegg, John E. Black-water solar panel. 4,598,696, Cl. 126-448.000.

Clegg, John E. Band and drum clutch. 4,598,807, Cl. 192-80.000.

Clegg, John E. Conic camera. 4,598,987, Cl. 354-202.000.

Clemons, Donald G., to AT&T Bell Laboratories. Byte organized static memory. 4,599,709, Cl. 365-200.000.

Clik-Cut, Inc.: *See—*
Ruff, Stanley L.; and Stubbmann, Albert, 4,598,531, Cl. 53-461.000.

Clissett, Peter A. G.: *See—*
Glover, John H.; Arnold, Edward J.; and Clissett, Peter A. G., 4,598,809, Cl. 192-111.00A.

Cloke, Robert L., to Sperry Corporation. Phase detector with independent offset correction. 4,599,570, Cl. 328-155.000.

Clorox Company, The: *See—*
Choy, Clement K.; and Keen, Frederick I., 4,599,186, Cl. 252-102.000.

Coats, James M.: *See—*
Aposchanski, Alexander; Buglione, Arthur J.; Coats, James M.; and Edelman, Brian S., 4,599,694, Cl. 364-431.050.

Cobb, Raymond L., to Phillips Petroleum Company. Purification of iodine-containing mixtures and compositions useful therefor. 4,599,472, Cl. 585-459.000.

Cobe Laboratories, Inc.: *See—*
Dykstra, Raymond C., 4,599,055, Cl. 417-477.000.

Cohen, Fred M. Artificial heart valve. 4,599,081, Cl. 623-2.000.

Cohen, Thomas S., to AMP Incorporated. Coaxial jack connector. 4,598,961, Cl. 339-17.00C.

Colburn, Michael D., to Cargill Detroit Corporation. Deburring system. 4,599,020, Cl. 408-211.000.

Cole, Gerald S.: *See—*
Yen, Chia-Ming; Cole, Gerald S.; and Nowicki, Roman M., 4,598,754, Cl. 164-4.100.

Cole-Hamilton, David J.: *See—*
Mullin, John B.; Holliday, Arthur K.; Cole-Hamilton, David J.; Jones, Anthony C.; and Gerrard, Neil D., 4,599,150, Cl. 204-59.0QM.

Cole, Rodney D. Material applicator. 4,598,723, Cl. 132-88.700.

Coleco Industries, Inc.: *See—*
McNett, John P., 4,598,976, Cl. 350-79.000.

Coleman Company, Inc., The: *See—*
Beckham, Hugh C.; and Bean, Robert M., 4,599,683, Cl. 362-166.000.

Colgate-Palmolive Company: *See—*
Hoffman, Klaus-Peter, 4,598,489, Cl. 40-310.000.
Misevich, Kenneth W., 4,598,487, Cl. 36-114.000.

Colle, Edward A., Jr.: *See—*
Vann, Roy R.; and Colle, Edward A., Jr., 4,598,775, Cl. 175-4.600.

Collier-Kenworth Company: *See—*
Cone, Richard E., 4,598,946, Cl. 297-258.000.

Collins, Richard J.: *See—*
Wagstaff, Frank E.; Wagstaff, William G.; and Collins, Richard J., 4,598,763, Cl. 164-472.000.

Colliver, Anthony D., to Coolair Corporation Pte., Ltd. Fan casing volute. 4,599,042, Cl. 415-204.000.

Colquhoun, Howard M.; and Breeze, Alan G., to Imperial Chemical Industries PLC. Chemical process. 4,599,452, Cl. 568-319.000.

Colson, Dale G. Valve assembly for placement over a capped, stub-out which is under water pressure in a dwelling. 4,598,731, Cl. 137-318.000.

Columbia University in the City of New York, The Trustees of: *See—*
Bito, Laszlo Z., 4,599,353, Cl. 514-530.000.

Colvin, David S. Wrench opening. 4,598,616, Cl. 81-124.600.

Colyer, Timothy D.: *See—*
Kauffman, William J.; Colyer, Timothy D.; and Dees, Martin, Jr., 4,599,264, Cl. 428-264.000.

Cometta, Robert A.: *See—*
Culmer, Daniel D.; and Cometta, Robert A., 4,599,634, Cl. 357-40.000.

Commissariat a l'Energie Atomique: *See—*
de Tassigny, Christian, 4,599,196, Cl. 252-628.000.

Commodore Business Machines Inc.: *See—*
Redfield, James W., 4,599,528, Cl. 307-443.000.

Comoli, Ettore: *See—*
Pollini, Piero; Bertele, Giovanni M.; and Comoli, Ettore, 4,599,072, Cl. 441-65.000.

Compagnie General de Geophysique: *See—*
Rudaz, Jean A., 4,599,713, Cl. 367-178.000.

Compagnie Generale des Etablissements Michelin: *See—*
Campos, Francis; and Herbelleau, Yves, 4,598,748, Cl. 152-209.00R.
Flechtner, Charles, 4,598,747, Cl. 152-209.00R.

Compagnie Industrielle des Telecommunication Cit-Alcatel: *See—*
Surie, Serge; and Marcel, Francois, 4,599,735, Cl. 375-54.000.

Compeau, Michael E.; and Rogers, Lloyd W., to General Motors Corporation. Control means for occupant restraint belt system. 4,598,932, Cl. 280-807.000.

Conair Corporation: *See—*
Doyle, Edward J., 4,598,722, Cl. 132-33.00R.

Cone, Richard E., to Collier-Kenworth Company. Rocking infant seat. 4,598,946, Cl. 297-258.000.

Conrow, Ransom B.; and Bernstein, Seymour, to American Cyanamid Company. Multisulfonated naphthalene ureas useful as complement inhibitors. 4,599,203, Cl. 260-506.000.

Consiglio Nazionale Delle Ricerche: *See—*
Fragale, Carlo; Gargano, Michele; and Rossi, Michele, 4,599,453, Cl. 568-387.000.

Control Interface Company Limited: *See—*
Hladky, Walter; DeVito, Ralph J.; and Hoffman, Louis S., 4,599,070, Cl. 434-45.000.

Controls Company of America: *See—*
Duve, John P., 4,599,499, Cl. 200-35.00R.

Conveyor Corporation of America, Inc.: *See—*
Adams, David J., 4,598,815, Cl. 198-372.000.

Coolair Corporation Pte., Ltd.: *See—*
Colliver, Anthony D., 4,599,042, Cl. 415-204.000.

Cooper, Brian F.; and Cottey, David H., to English Electric Valve Company. Method for fabricating coupled cavity travelling wave tubes. 4,598,465, Cl. 29-600.000.

Cooper, Daniel; and Jackson, Jacqueline J., to Hemotec, Inc. Coagulation detection by plunger sensing technique. 4,599,219, Cl. 422-61.000.

Cooper Industries, Inc.: *See—*
Severs, Christopher W.; and Leonard, William L., 4,598,511, Cl. 52-157.000.

Cooper, Paul V., to Kennecott Corporation. Light gauge metal scrap melting system. 4,598,899, Cl. 266-212.000.

Cooper, Stephen A., to Cooper, Stephen A. Hydroxyzine-containing analgesic combinations. 4,599,359, Cl. 514-557.000.

Copytele, Inc.: *See—*
DiSanto, Frank J.; and Krusos, Denis A., 4,598,960, Cl. 339-17.00M.

Corda, Francesco: *See—*
Bosone, Enrico; Caprara, Giuseppe; Corda, Francesco; Gozzo, Franco; Menconi, Augusto; Piccardi, Paolo; and Caprioli, Vincenzo, 4,599,358, Cl. 514-521.000.

Cordes, Harry B.: *See—*
McGuire, Donald W.; and Cordes, Harry B., 4,599,600, Cl. 340-347.00P.

Cordis Corporation: *See—*
Arenas, Alvaro; Bales, Thomas O.; and Box, John W., 4,598,466, Cl. 29-623.200.
Beranek, William J., 4,598,708, Cl. 128-303.00R.
Cummings, Joel; and Hooven, Michael D., 4,598,579, Cl. 73-37.000.

Cornacchia, Felice: *See—*
Di Giusto, Nevio; and Cornacchia, Felice, 4,598,497, Cl. 49-374.000.

Cornell, Ronald G.; Huensch, George D.; Shelhamer, Kenneth W.; and Warty, Pramod, to AT&T Bell Laboratories. Control of telecommunication switching systems. 4,599,490, Cl. 179-2.0EB.

Correale, Mariano: *See—*
Maggioni, Paolo; Minisci, Francesco; and Correale, Mariano, 4,599,461, Cl. 568-652.000.

Corvinus & Roth GmbH: *See—*
Roth, Erland, 4,598,904, Cl. 272-65.000.

Cosden Technology, Inc.: *See—*
Debras, Guy L. G.; De Clippeleir, Georges E. M. J.; and Cahen, Raymond M., 4,599,473, Cl. 585-467.000.

Cottam, Johnny L., to D-Tec Industries, Inc. Method and apparatus for identifying unauthorized or defective converter/decoder boxes in CATV system. 4,599,646, Cl. 358-121.000.

Cottey, David H.: *See—*
Cooper, Brian F.; and Cottey, David H., 4,598,465, Cl. 29-600.000.

Couch, Robert P., to United Technologies Corporation. Electrostatic afterburner light-off detector. 4,599,568, Cl. 328-6.000.

Coull, Thomas B.: *See—*
McGillivray, Terrence L.; and Coull, Thomas B., 4,599,014, Cl. 405-225.000.

Couperus, Egbert: *See—*
Bronson, Larry D.; and Couperus, Egbert, 4,598,875, Cl. 241-78.000.

Courtesy Mold & Tool Corporation: *See—*
Kreiseder, Walter J.; and Vogel, Allen J., 4,598,837, Cl. 220-253.000.

Courtright, Harold D., to 4 Square Motors. Rotary hydraulic engine having oppositely disposed pistons in a scotch yoke assembly. 4,598,628, Cl. 91-481.000.

Cousin, Michel: *See—*
Meyer, Nicolas; and Cousin, Michel, 4,599,212, Cl. 264-255.000.

Cowan, Jack C., to Venture Chemicals, Inc. Humic substances with enhanced surface charge. 4,599,181, Cl. 252-8.50C.

Cox, Percy T.; and Warren, Wayne F., to Texaco Inc. High transmitting power deep penetration well logging sonde. 4,599,566, Cl. 324-341.000.

CPG Products Corp.: *See—*
Ventura, Frank D.; and Moormann, Randall H., 4,598,909, Cl. 273-60.00B.

Crase, Gary M., to Smith International, Inc. Universal joint and progressive cavity transducer using the same. 4,599,056, Cl. 418-48.000.

Cribb, W. Raymond: *See—*
Church, Nathan L.; Cribb, W. Raymond; and Harkness, John C., 4,599,120, Cl. 148-414.000.

Cromer, Charles J. Water heater partition and method. 4,598,694, Cl. 126-361.000.

Crooks, Lawrence E.: *See—*
Hoenninger, John C., III; Crooks, Lawrence E.; and Arakawa, Mitsuaki, 4,599,565, Cl. 324-309.000.

Csizmadia, Lajos, to Licencia Talalmanyokat Ertekesito Vallalat. Bicycle portable as a bag. 4,598,923, Cl. 280-287.000.

Cukelj, Mirko. Multi-position stop-gauge. 4,598,480, Cl. 33-169.00R.

Culler, Daryl L.: *See—*
Hodge, Dean R.; and Culler, Daryl L., 4,598,988, Cl. 354-312.000.

Culmer, Daniel D.; and Cometta, Robert A., to National Semiconductor Corporation. Stress insensitive integrated circuit. 4,599,634, Cl. 357-40.000.

Cummings, Joel; and Hooven, Michael D., to Cordis Corporation. Portable instrument to test pressure/flow of ventricular shunt valves. 4,598,579, Cl. 73-37.000.

Cuomo, Frank W., to United States of America, Navy. Multi-lever miniature fiber optic transducer. 4,599,711, Cl. 367-141.000.

Cuttica, Angelo, to J & G Importing Inc. Article of furniture having changeable decorative surface. 4,599,254, Cl. 428-45.000.

Cycles Peugeot: *See—*
Fourrey, Francois; and Barnabe, Jean-Pierre, 4,598,947, Cl. 297-362.000.
Fourrey, Francois, 4,598,950, Cl. 297-452.000.

Cymbaluk, Ted H.; Byers, Jim D.; and Johnson, Marvin M., to Phillips Petroleum Company. Hydrogenation process. 4,599,469, Cl. 570-193.000.

Czubachowski, Zygmunt J.: *See—*
Haltof, Garry P.; Stephens, Eugene S.; and Czubachowski, Zygmunt J., 4,598,498, Cl. 49-407.000.

D. C. Johnson & Associates, Inc.: *See—*
Johnson, David C.; and Allen, James S., 4,598,741, Cl. 141-5.000.

D. L. Auld Company, The: *See—*
Bree, Charles E., 4,599,253, Cl. 428-40.000.

D-Tec Industries, Inc.: *See—*
Cottam, Johnny L., 4,599,646, Cl. 358-121.000.

Dai-Ichi Seiko Co., Ltd.: *See—*
Konishi, Akira, 4,599,062, Cl. 425-116.000.

Daicel Chemical Industries, Ltd.: *See—*
Toga, Yuzo; Okamoto, Ichiro; and Kanno, Tatsuya, 4,599,460, Cl. 568-617.000.

Daimler-Benz Aktiengesellschaft: *See—*
Gluck, Roland; Heilemann, Otto; and Bartsch, Gunter, 4,598,671, Cl. 123-41.310.
Scholz, Hans-Jurgen; Brambilla, Luigi; Katz, Egon; Bossenmaier, Alban; and Zweigart, Gerhard, 4,598,943, Cl. 296-97.00H.
Sorsche, Joachim H.; and Peitsmeier, Karl, 4,598,604, Cl. 74-493.000.

Dainippon Screen Seizo K.K.: *See—*
Kondo, Syuzi; Yamano, Akira; and Toei, Keiji, 4,599,295, Cl. 430-156.000.

Daishowa Seiki Co., Ltd.: *See—*
Kubo, Haruaki; and Kamanaka, Yoshiyuki, 4,598,617, Cl. 82-36.00R.

Damiano, Michael A.; Kramer, Dennis M.; and Schmerda, Richard F., to Eaton Corporation. Solid state DC power control system. 4,599,555, Cl. 323-351.000.

Dana Corporation: *See—*
Flotow, Richard A., 4,598,808, Cl. 192-98.000.

D'Angelo, Joseph T. Fire failure safety control for stokers. 4,598,648, Cl. 110-193.000.

Danielson, Michael S., to Northrop Corporation. Compensation of gain temperature coefficient in an optical pick-off for an accelerometer. 4,598,586, Cl. 73-517.00B.

Danihel, Michael. Kinetic energy transducing system. 4,598,547, Cl. 60-507.000.

Dare Products, Inc.: *See—*
Wilson, Robert M., Jr., 4,599,488, Cl. 174-158.00F.

Darowski, Marek; and Hedenstierna, Goran, to Polska Akademia Nauk Instytut Biocybernetyki i Inzynierii Biomedycznej. Apparatus for independent ventilation of two lungs with selective use of positive end-expiratory pressures. 4,598,706, Cl. 128-205.240.

Data Translations, Inc.: *See—*
Berman, Ari P., 4,599,689, Cl. 364-200.000.

Dautzenberg, Horst; Loth, Fritz; Borrmeister, Bodo; Bertram, Dieter; Lettau, Herbert; Stamberg, Jiri; and Peska, Jan, to Veb Leipziger Arzneimittel Werk. Method of producing absorbing wound dressing. 4,599,209, Cl. 264-7.000.

Davey, Ernest A.: *See—*
Hidler, Henry T.; Hope, Lawrence L.; Davey, Ernest A.; and Schrank, Martin P., 4,599,538, Cl. 313-512.000.

Davis, Marshall E.; and Sung, Rodney L., to Texaco Inc. Clear stable gasoline-alcohol-water motor fuel composition. 4,599,088, Cl. 44-51.000.

Day, Robert A., II: *See—*
Breen, Robert N.; Day, Robert A., II; Lawrence, Victor B.; and Zboray, Michael R., 4,599,719, Cl. 370-24.000.

Day, William J.: *See—*
Herreiko, Edward J.; Hurley, James E.; and Day, William J., 4,598,691, Cl. 126-41.00R.

DCI Marketing: *See—*
Zakrajsek, Jerome A., 4,598,838, Cl. 220-404.000.

De La Rue Giori S.A.: *See—*
Sauer, Hartmut K.; and Germann, Albrecht J., 4,598,642, Cl. 101-415.100.

DeBerry, David W.; and Viehbeck, Alfred, to SumX Corporation. Photoelectrochromic display. 4,599,614, Cl. 340-785.000.

Debras, Guy L. G.; De Clippeleir, Georges E. M. J.; and Cahen, Raymond M., to Cosden Technology, Inc. Process for para selective alkylation of aromatic hydrocarbons. 4,599,473, Cl. 585-467.000.

De Clippeleir, Georges E. M. J.: *See—*
Debras, Guy L. G.; De Clippeleir, Georges E. M. J.; and Cahen, Raymond M., 4,599,473, Cl. 585-467.000.

Dees, H. Craig; and Schultz, Ronald D., to Wisconsin Alumni Research Foundation. Injectable pharmaceutical preparation for the induction of multiple follicular growth. 4,599,227, Cl. 424-38.000.

Dees, Martin, Jr.: *See—*
Kauffman, William J.; Colyer, Timothy D.; and Dees, Martin, Jr., 4,599,264, Cl. 428-264.000.

DeFelsko Corporation: *See—*
Koch, Frank, 4,599,562, Cl. 324-230.000.

Deffner, John F.: *See—*
Young, Raymond R.; and Deffner, John F., 4,598,828, Cl. 211-59.200.

DeGroat, Philip M. Combined latch and hinge for vehicle covers. 4,598,940, Cl. 292-108.000.

Dehnert, Johannes; and Junemann, Werner, to BASF Aktiengesellschaft. Metal complex dyes containing azo azomethine groups. 4,599,402, Cl. 534-700.000.

Dell'Acqua, Ernani: *See—*
Bruzzese, Tiberio; Dell'Acqua, Ernani; Ottoni, Franco; and van den Heuvel, Holger H., 4,599,406, Cl. 544-49.000.

Delvecchio, Robert M.; and Foster, Karl, to Westinghouse Electric Corp. Magnetostrictive transducer. 4,599,591, Cl. 335-215.000.

Demaison, Gerard J.; and Kaplan, Isaac R., to Chevron Research Company. Capture box for predicting hydrocarbon potential of an earth formation underlying a body of water. 4,599,218, Cl. 422-61.000.

Demarest, Henry M., Jr., to PPG Industries, Inc. Melting glass with port and melter burners for NO_x control. 4,599,100, Cl. 65-134.000.

DeMasi, Dominick F.: *See—*
Miles, John J., Jr.; and DeMasi, Dominick F., 4,599,363, Cl. 514-770.000.

Demay, Claude; and Bourgeois, Claude, to CDF Chimie Specialites. Catalytic system for the hydroformylation of olefins process of hydroformylation. 4,599,323, Cl. 502-161.000.

DeMoyer, Robert: *See—*
Vranish, John M.; Mitchell, Eugene; and DeMoyer, Robert, 4,598,595, Cl. 73-862.080.

DeNale, Robert: *See—*
Lukens, William E.; and DeNale, Robert, 4,599,505, Cl. 219-74.000.

Denenberg, Jeffrey N., to ITT Corporation. Probabilistic learning system. 4,599,693, Cl. 364-513.000.

Denenberg, Jeffrey N.: *See—*
Tan, Chuan-Chieh; Slack, Thomas B.; and Denenberg, Jeffrey N., 4,599,692, Cl. 364-513.000.

Deniega, Jose C., to American Cyanamid Company. Surgical instrument. 4,598,711, Cl. 128-326.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Ando, Toshihiro; Nakanishi, Yutaka; and Ukita, Kenkichi, 4,599,274, Cl. 428-442.000.

Deschamps, Jean-Francois: *See—*
Petit, Pierre; Grenier, Maurice; and Deschamps, Jean-Francois, 4,599,097, Cl. 62-36.000.

DeSoto, Inc.: *See—*
Sekmakas, Kazys; and Shah, Raj, 4,599,417, Cl. 544-316.000.

de Souza, Noel J.: *See—*
Bajwa, Balbir S., deceased; Chatterjee, Dipak K.; Ganguli, Bimal N.; Reden, Jurgen; and de Souza, Noel J., 4,599,409, Cl. 544-126.000.

De Stephanis, Ralph: *See—*
Goodlad, Albert P.; and De Stephanis, Ralph, 4,599,035, Cl. 414-697.000.

de Tassigny, Christian, to Commissariat a l'Energie Atomique. Process for the conditioning of contaminated waste, particularly cation exchange materials. 4,599,196, Cl. 252-628.000.

Deutsch, Robert, to Motorola, Inc. Microprocessor transient interrupt system adaptable for engine control. 4,599,695, Cl. 364-431.110.

Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See—*
Schmidt, Werner; and Hahn, Bernd D., 4,599,518, Cl. 250-507.100.
Schroder, Gunter, 4,598,727, Cl. 137-15.000.

Deutsche Nemectron GmbH: *See—*
Hansjurgens, Achim; and Mionskowski, Gerhard, 4,598,713, Cl. 128-421.000.

DeVerohn Corporation: *See—*
Stephens, Eugene, 4,599,682, Cl. 362-103.000.

DeVito, Ralph J.: *See—*
Hladky, Walter; DeVito, Ralph J.; and Hoffman, Louis S., 4,599,070, Cl. 434-45.000.

Devries, Louis; and Ryason, P. R., to Chevron Research Company. Conversions of low molecular weight hydrocarbons to higher molecular weight hydrocarbons using a metal-containing catalyst. 4,599,474, Cl. 585-415.000.

DeWald, Carl O.; and Pollock, Jack H., to Precision Technologies. Plug valve with hydraulically actuated seals. 4,598,895, Cl. 251-78.000.

Dewinck, Jean; and Hancart, Lucien, to Ateliers de Constructions Electriques de Charleroi. Process for the manufacture of collectors of direct current electric machines. 4,598,464, Cl. 29-597.000.

Deyer, Craig E., to RCA Corporation. System for inputting a selected one of a plurality of inputs to a computer. 4,599,606, Cl. 340-365.00S.

Diamond Oil Well Drilling Company: *See—*
Park, Arthur; and Wilson, Bob T., 4,598,777, Cl. 175-58.000.

Diamond Shamrock Chemicals Company: *See—*
Bardoliwalla, Dinshaw F.; and Grinstein, Reuben H., 4,599,372, Cl. 523-336.000.
Maloney, James E., 4,599,190, Cl. 252-174.240.

Diana, Silvio. Pre-cast building structure. 4,598,515, Cl. 52-236.100.

Dicke, Hans-Rudolf; Schmidt, Manfred; Witman, Mark; and El-Sayed, Aziz, to Bayer Aktiengesellschaft. Thermotropic, aromatic polyesters having good mechanical strength, containing sulfonic acid groups or metal sulfonate groups a process for the production thereof. 4,599,395, Cl. 528-173.000.

Dickens, Jonathan P.; Donald, David K.; Kneen, Geoffrey; and McKay, William R., to G. D. Searle & Co. Hydroxamic acid based collagenase inhibitors. 4,599,361, Cl. 514-575.000.

Dickey, Leland C., to InterNorth, Inc. Continuous flow separation with moving boundary sorption. 4,599,225, Cl. 423-659.000.

Die Firma Follpack Dipl Brauerei-ing Dieter Wieland: *See—*
Wieland, Dieter; Meinert, Hartmut; and Pohl, Hans-Ulrich, 4,599,239, Cl. 426-590.000.

Diesel Kiki Co., Ltd.: *See—*
Ishikawa, Masataka; and Kondo, Masami, 4,599,674, Cl. 361-154.000.

Dietlein, John E.: *See—*
Bauman, Therese M.; and Dietlein, John E., 4,599,367, Cl. 521-71.000.

Diggle, Edmund A., Jr., to Samcoe Holding Corporation. Spreader-propeller apparatus for tubular knitted fabric. 4,598,444, Cl. 26-84.000.

Digital Equipment Corporation: *See—*
Bowker, Roger S.; Olsen, Linda J.; and Hines, Jesse M., 4,599,611, Cl. 340-721.000.

Di Giusto, Nevio; and Cornacchia, Felice, to Fiat Auto S.p.A. Sliding pane for motor vehicle windows. 4,598,497, Cl. 49-374.000.

Dillard, Homer E.: *See—*
Brown, Raymond E.; Dillard, Homer E.; Green, James W.; and McIntosh, Stuart A., 4,599,645, Cl. 358-104.000.

Dimitroff, Vladimir T., Jr.; and Wagner, James B., to General Electric Company. Apparatus and method for controlling steam turbine operating conditions during starting and loading. 4,598,551, Cl. 60-646.000.

Director-General of the Agency of Industrial Science and Technology, an Organ of the Ministry of International Trade and Industry of Japan: *See—*
Murase, Ichiki; Ohnishi, Toshihiro; and Noguchi, Takanobu, 4,599,193, Cl. 252-511.000.

DiSanto, Frank J.; and Krusos, Denis A., to Copytele, Inc. Methods and apparatus for connecting closely spaced large conductor arrays employing multi-conductor carrier boards. 4,598,960, Cl. 339-17.00M.

Dischert, Robert A., to RCA Corporation. Television camera with multiplexed A-D converter. 4,599,640, Cl. 358-50.000.

DiStefano, Thomas H.: *See—*
Castellano, Anthony J., Jr.; DiStefano, Thomas H.; and Olyha, Robert S., Jr., 4,599,558, Cl. 324-158.00R.

Dixon International Limited: *See—*
Malcolm-Brown, Tessa, 4,599,369, Cl. 523-179.000.

Dobbelstein, Arnold: *See—*
Loch, Werner; Schupp, Eberhard; Osterloh, Rolf; Dobbelstein, Arnold; and Ahlers, Klaas, 4,599,371, Cl. 523-402.000.

Dockner, Toni; Sauerwald, Manfred; Manegold, Jost H.; and Leitner, Hans, to BASF Aktiengesellschaft. Preparation of adipodinitrile. 4,599,202, Cl. 558-313.000.

Doi, Yoshikazu; Miyano, Hitoshi; Kishikawa, Toshiro; and Sunaga, Yasumasa, to Fuji Photo Optical Co., Ltd. Objective optical system for endoscope. 4,598,980, Cl. 350-445.000.

Doll, David W.; and Hager, E. Randolph, to United States of America, Energy. Remote controlled vacuum joint closure mechanism. 4,598,936, Cl. 285-18.000.

Dombroski, Edward; and Potts, Richard W., to Peerless Tube Company. Tamper evident squeeze tube. 4,598,839, Cl. 222-92.000.

Dombrowski, Ferdinand; and Forster, Dieter, to Sunvic Regler GmbH. Electric measuring converter for level. 4,598,584, Cl. 73-308.000.
Donahue, Robert L., to Hein-Werner Corporation. Intersecting laser alignment apparatus and method. 4,598,481, Cl. 33-288.000.
Donald, David K.: *See—*
Dickens, Jonathan P.; Donald, David K.; Kneen, Geoffrey; and McKay, William R., 4,599,361, Cl. 514-575.000.
Donn Incorporated: *See—*
Shirey, Richard, 4,598,514, Cl. 52-232.000.
Slapsys, Michael; and Everitt, Brian T., 4,598,521, Cl. 52-484.000.
Dorer, David K.: *See—*
Williams, Sam B.; Jones, John F.; and Dorer, David K., 4,598,544, Cl. 60-226.100.
Doring, Michael; Bentin, Horst K.; and Maier, Herman F. L., to U.S. Philips Corporation. Microplanar ink-jet printing head. 4,599,628, Cl. 346-140.00R.
Dose, Peter: *See—*
Neubuser, Siegmar; Dose, Peter; and Herrig, Friedhelm, 4,599,039, Cl. 414-786.000.
Doty, James R. Spine stabilization device and method. 4,599,086, Cl. 623-17.000.
Dougherty, William E., Jr.; Greer, Stuart E.; and Sargent, Robert W., to International Business Machines Corporation. Method for providing improved electrical and mechanical connection between I/O pin and transverse via substrate. 4,598,470, Cl. 29-837.000.
Doughty, Robert L.: *See—*
Douglas, Robert J.; Doughty, Robert L.; Mungovan, John P.; Andersen, Robert P.; and Abbott, Vaughan, 4,599,101, Cl. 65-164.000.
Douglas, Alan D.; MacInnis, Martin B.; and Reilly, Kenneth T., to GTE Products Corporation. Recovery of tungsten and rhenium. 4,599,222, Cl. 423-49.000.
Douglas, Alan D.; Reilly, Kenneth T.; MacInnis, Martin B.; Powers, John A.; and Christini, James N., to GTE Products Corporation. Separation of tungsten from rhenium. 4,599,223, Cl. 423-49.000.
Douglas, Robert J.; Doughty, Robert L.; Mungovan, John P.; Andersen, Robert P.; and Abbott, Vaughan, to Emhart Industries, Inc. Universal servo-driven gob distributor. 4,599,101, Cl. 65-164.000.
Dover Corporation: *See—*
Taylor, Paul R., 4,598,742, Cl. 141-95.000.
Dow Chemical Company, The: *See—*
Durvasula, Visweswara R., 4,599,445, Cl. 562-419.000.
Malhotra, Sudarshan K.; and Gerwick, B. Clifford, III, 4,599,105, Cl. 71-94.000.
McKinney, Osborne K.; Flores, David P.; and Eversdyk, David A., 4,599,392, Cl. 526-318.600.
Rice, Charles A., 4,598,862, Cl. 239-8.000.
Tomalia, Donald A.; and Hall, Mark J., 4,599,400, Cl. 528-405.000.
Dow Corning Corporation: *See—*
Bauman, Therese M.; and Dietlein, John E., 4,599,367, Cl. 521-71.000.
Dow Corning, Ltd.: *See—*
White, James W.; Westall, Stephen; and Griffiths, Brian J., 4,599,438, Cl. 556-439.000.
Doyle, Edward J., to Conair Corporation. Elastomer hair roller. 4,598,722, Cl. 132-33.00R.
Drake, Charles A., to Phillips Petroleum Company. Method for producing ketones and phenols. 4,599,322, Cl. 502-150.000.
Drake, Charles A., to Phillips Petroleum Company. Novel aldehyde-phosphine compositions and uses therefor. 4,599,456, Cl. 568-421.000.
Drent, Eit, to Shell Oil Company. Process for the preparation of dimerization products from olefins. 4,599,476, Cl. 585-511.000.
Dresser Industries, Inc.: *See—*
Highsmith, Albert E., 4,598,778, Cl. 175-371.000.
Dressler, Hans, to Koppers Company, Inc. Novel compositions. 4,599,464, Cl. 568-766.000.
Driscoll, Patrick R., to Rhone-Poulenc, Inc. 5-substituted thiadiazole ureas and their use as herbicides. 4,599,424, Cl. 548-140.000.
Drutchas, Gilbert H., to TRW Inc. Control apparatus for power assist steering system. 4,598,787, Cl. 180-79.100.
Duffield, Dean W., to Precision Valve Australia Pty, Limited. Method for severing laminates. 4,599,126, Cl. 156-268.000.
Dufresne, Raymond A.: *See—*
Goodman, C. Richard, 4,598,971, Cl. 339-228.000.
Dugge, Richard H.; and Gruner, Donald E., to ACF Industries, Incorporated. High volume covered hopper car. 4,598,646, Cl. 105-248.000.
Duhault, Jacques: *See—*
Regnier, Gilbert; Guillonneau, Claude; Duhault, Jacques; and Roman, Francois, 4,599,338, Cl. 514-265.000.
Duliba, Paul: *See—*
Khare, Ashok; and Duliba, Paul, 4,599,502, Cl. 219-8.500.
Du Pont de Nemours, E. I., and Company: *See—*
Amey, Ronald L., 4,599,422, Cl. 546-251.000.
Carlson, Dana P.; Kerbow, Dewey L.; Leck, Thomas J.; and Olson, Allan H., 4,599,386, Cl. 525-326.200.
Levitt, George, 4,599,103, Cl. 71-90.000.
Neiss, Melvin A.; and Woodruff, Robert W., 4,599,299, Cl. 430-273.000.
Sandell, Lionel S., 4,599,412, Cl. 544-211.000.
Wills, Thomas M., 4,598,453, Cl. 29-271.000.
Wojtkowski, Paul W., 4,599,451, Cl. 568-54.000.
Dupont, Joseph: *See—*
Letard, Michel; Renouvin, Daniel; and Dupont, Joseph, 4,598,919, Cl. 280-79.10R.
Durkoppwerke GmbH: *See—*
Grube, Erwin; and Kuhlmann, Walter, 4,598,812, Cl. 198-343.000.
Durr Anlagenbau GmbH: *See—*
Otto, Eberhard; Mutschelknaus, Rolf; and Hauptmann, Andreas, 4,598,633, Cl. 98-115.200.
Durvasula, Visweswara R., to Dow Chemical Company, The. Process for benzophenone tetracarboxylic acid deanhydride. 4,599,445, Cl. 562-419.000.
Dutil, Robert; and Gilbert, Raymond. Automatic transmission for a bicycle and the like-pedaled apparatus. 4,598,920, Cl. 280-236.000.
Duvdevani, Ilan; Schulz, Donald N.; Kitano, Kissho; and Peiffer, Dennis G., to Exxon Research and Engineering Co. Acid base interacting polymer solutions. 4,599,377, Cl. 524-516.000.
Duve, John P., to Controls Company of America. Fast impulse timer drive mechanism. 4,599,499, Cl. 200-35.00R.
Dwyer, Douglas F. G.; and Bower, David E., to Standard Telephones & Cables, plc. Surface acoustic wave accelerometer. 4,598,587, Cl. 73-517.00R.
Dykstra, Raymond C., to Cobe Laboratories, Inc. Peristaltic pump. 4,599,055, Cl. 417-477.000.
E. Blum GmbH & Co.: *See—*
Geschka, Hugo W., 4,599,595, Cl. 336-178.000.
E. C. H. Will (GmbH & Co.): *See—*
Neubuser, Siegmar; Dose, Peter; and Herrig, Friedhelm, 4,599,039, Cl. 414-786.000.
E. R. Squibb & Sons, Inc.: *See—*
Misra, Raj N., 4,599,439, Cl. 556-443.000.
Eastman Kodak Company: *See—*
Griffith, Neil J., 4,599,668, Cl. 360-113.000.
Gunther, Wolfgang H. H., 4,599,410, Cl. 544-137.000.
Reczek, James A.; Ponticello, Ignazio S.; and Bryan, Philip S., 4,599,389, Cl. 526-265.000.
Yoerger, William E.; and Sorriero, Louis J., 4,599,290, Cl. 430-108.000.
Eaton Corporation: *See—*
Damiano, Michael A.; Kramer, Dennis M.; and Schmerda, Richard F., 4,599,555, Cl. 323-351.000.
Nellums, Richard A.; Braun, Eugene R.; and Holtzhauser, Joseph C., 4,598,609, Cl. 74-650.000.
Eberspacher, J.: *See—*
Langen, Herbert; and Reuter, Fritz, 4,599,052, Cl. 417-413.000.
Eberts, Terry R.: *See—*
Goodman, C. Richard, 4,598,971, Cl. 339-228.000.
Eck, Henry H., to Pulse Electronics, Inc. Method of encoding data for serial transmission. 4,599,723, Cl. 371-47.000.
Eckell, Albrecht; Elzer, Albert; Hoffmann, Gerhard; Leyrer, Reinhold J.; and Werther, Heinz-Ulrich, to BASF Aktiengesellschaft. Toner transfer process for transferring and fixing a toner image by means of film. 4,599,293, Cl. 430-126.000.
Eckstein, Roger J.: *See—*
Sasser, Bill H.; Eckstein, Roger J.; and Engle, Kenneth, 4,599,584, Cl. 333-125.000.
Ecodyne Corporation: *See—*
Nowlin, Duane D.; and Walton, Raymond C., 4,599,047, Cl. 417-63.000.
Edakubo, Hiroo: *See—*
Kozuki, Susumu; Takimoto, Hiroyuki; Edakubo, Hiroo; and Takayama, Nobutoshi, 4,599,660, Cl. 360-77.000.
Edelman, Brian S.: *See—*
Aposchanski, Alexander; Buglione, Arthur J.; Coats, James M.; and Edelman, Brian S., 4,599,694, Cl. 364-431.050.
Eden, James G.; and Killeen, Kevin P., to United States of America, Navy. Visible and ultraviolet lasers based on excimer transitions in the homonuclear halogens. 4,599,730, Cl. 372-57.000.
Edinger, Egon: *See—*
Klink, Gerhard; Kraske, Dietmar; Edinger, Egon; Koetter, Joachim; Krumrey, Klaus; Mayser, Jorg; and Michael, Ulrich, 4,598,459, Cl. 29-564.800.
Edwards, Hugh A.; and Patchell, John W., to Allied Corporation; and Senstar Security Systems Corporation. Method of producing leaky coaxial cable. 4,599,121, Cl. 156-48.000.
Edwards, Richard R.: *See—*
Anglin, Jeanne M.; Edwards, Richard R.; and Thomas, John E., 4,599,255, Cl. 428-73.000.
EGA Limited: *See—*
Bramwell, David W., 4,599,484, Cl. 174-52.00R.
Eglais, Aldis O., to Tsarnikavsky Rybolovetsky Kolkhoz "Tsarnikava" . Arrangement for controlling the spinnaker of a sail catamaran. 4,598,658, Cl. 114-39.000.
Egner-Walter, Bruno; and Schmid, Eckhardt, to ITT Industries, Inc. Windshield wiper. 4,598,438, Cl. 15-250.320.
Eian, Gilbert L.; and Trend, John E., to Minnesota Mining and Manufacturing Co. Photolabile blocked surfactants and compositions containing the same. 4,599,273, Cl. 428-412.000.
Eichelsbacher, Michael; Kohlen, Rudolph; Reimert, Rainer; Hafke, Carl; and Schafer, Wolfgang, to Ruhrgas Aktiengesellschaft. Process for the gasification of carbonaceous agglomerates in a fixed bed reactor. 4,599,092, Cl. 48-197.00R.
Eida, Tsuyoshi: *See—*
Yokoyama, Yasumasa; Komori, Tomoko; Eida, Tsuyoshi; Koike, Shoji; and Kobayashi, Masatsune, 4,599,112, Cl. 106-22.000.
Eis, Gunter: *See—*
Glaubitz, Franz; Eis, Gunter; and Fromme, Werner, 4,598,718, Cl. 130-27.0AE.

Eisai Co., Ltd.: *See*—
Kaneko, Takeru; Ozaki, Satoru; Takizawa, Kimie; and Sugimoto, Hachiro, 4,599,337, Cl. 514-265.000.
Sugimoto, Hachiro; Hamano, Sachiyuki; and Shoji, Tadao, 4,599,414, Cl. 544-267.000.
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Nakamoto, Kouji; Kajiwara, Akiharu; Katayama, Kouichi; Tsunoda, Hajime; Murakami, Manabu; Ono, Hideki; and Yamada, Kouji, 4,599,328, Cl. 514-106.000.

Eke, Kenneth I., to Microwave Ovens Limited. Oven systems. 4,598,689, Cl. 126-21.00A.

Electra Mikun (Industries) Ltd.: *See*—
Raz, Dan, 4,599,033, Cl. 414-589.000.

Eli Lilly and Company: *See*—
Nichols, Cynthia L.; and Kornfeld, Edmund C., 4,599,339, Cl. 514-267.000.

Elitex, koncern textilniho strojirenstvi: *See*—
Kroupa, Petr; Sramek, Rudolf; and Fantl, Jiri, 4,598,537, Cl. 57-5.000.

Elliott, David J.; and Pennella, Filippo, to Phillips Petroleum Company. Synthesis of ketones from alcohols. 4,599,454, Cl. 568-387.000.

Ellstrom, Sven H. Window panel. 4,598,520, Cl. 52-456.000.

El-Sayed, Aziz: *See*—
Dicke, Hans-Rudolf; Schmidt, Manfred; Witman, Mark; and El-Sayed, Aziz, 4,599,395, Cl. 528-173.000.

Elsbree, Charles N., Jr.; and Kuhne, Werner, to Symtron Corporation. Pin inserter for electronic boards. 4,598,471, Cl. 29-845.000.

Elsenbaumer, Ronald L.: *See*—
Frommer, Jane E.; and Elsenbaumer, Ronald L., 4,599,194, Cl. 252-518.000.

Elzer, Albert: *See*—
Eckell, Albrecht; Elzer, Albert; Hoffmann, Gerhard; Leyrer, Reinhold J.; and Werther, Heinz-Ulrich, 4,599,293, Cl. 430-126.000.

Emhart Industries, Inc.: *See*—
Douglas, Robert J.; Doughty, Robert L.; Mungovan, John P.; Andersen, Robert P.; and Abbott, Vaughan, 4,599,101, Cl. 65-164.000.
Jones, Stanley P., 4,599,099, Cl. 65-29.000.

Endo, Kiyonobu, to Canon Kabushiki Kaisha. Photo-magnetic reproducing apparatus. 4,599,714, Cl. 369-13.000.

Enelf Inc.: *See*—
Goupillaud, Pierre L.; Morlet, Jean P.; and Grossmann, Alexandre, 4,599,567, Cl. 324-77.00G.

Energy Conversion Devices, Inc.: *See*—
Holmberg, Scott; and Flasck, Richard A., 4,599,705, Cl. 365-163.000.

Energy Materials Corporation: *See*—
Jewett, David N.; Bates, Herbert E.; and Milstein, Joseph B., 4,599,132, Cl. 156-617.00H.

Energy Systems and Service Corp.: *See*—
Bader, Lawrence M., 4,598,668, Cl. 122-448.00B.

Enertronics, Inc.: *See*—
Thiele, Karl O.; and Toth, Steven L., 4,599,283, Cl. 429-99.000.

Engle, Kenneth: *See*—
Sasser, Bill H.; Eckstein, Roger J.; and Engle, Kenneth, 4,599,584, Cl. 333-125.000.

English Electric Valve Company: *See*—
Cooper, Brian F.; and Cottey, David H., 4,598,465, Cl. 29-600.000.

English Electric Valve Company Limited: *See*—
King, Robin C. M.; Esterson, Maurice; and Clarke, John, 4,599,542, Cl. 315-59.000.

Enyo, Hiroji: *See*—
Sato, Hozumi; Iwanaga, Shin-ichiro; Enyo, Hiroji; Takemura, Yasuhiko; and Kawamura, Yoshiaki, 4,599,382, Cl. 525-139.000.

Ernest, Raymond; and Ginsburg, Stephen J. Modular oral hygiene system. 4,598,437, Cl. 15-176.000.

Esaka, Hajime: *See*—
Kawai, Nobuyasu; Hirano, Minoru; Manto, Hiromune; Esaka, Hajime; and Fujimoto, Hirofumi, 4,599,109, Cl. 75-238.000.

Eshland Enterprises, Inc.: *See*—
Eshleman, Roger D., 4,598,649, Cl. 110-211.000.

Eshleman, Roger D., to Eshland Enterprises, Inc. Particle fuel diversion structure with dome-shaped cavity. 4,598,649, Cl. 110-211.000.

Esmay, Donald L., to Minnesota Mining and Manufacturing Company. Removable pressure-sensitive adhesive tape. 4,599,265, Cl. 428-355.000.

Esposito, Chris, to Four Seasons Solar Products Corporation. Guide element especially suitable for solar greenhouses and the like and particularly utilizable for controlled shading. 4,598,752, Cl. 160-272.000.

Esselte PAC Aktiebolag: *See*—
Christensson, Od W., 4,599,123, Cl. 156-69.000.

Essex Group, Inc.: *See*—
Lavallee, Francois A., 4,599,387, Cl. 525-419.000.

Essilor International Cie Generale d'Optique: *See*—
Lombard, Gerard, 4,598,502, Cl. 51-284.00R.

Esterson, Maurice: *See*—
King, Robin C. M.; Esterson, Maurice; and Clarke, John, 4,599,542, Cl. 315-59.000.

Ethyl Corporation: *See*—
Hargis, Duane C., 4,599,449, Cl. 564-409.000.
Wolfram, Joachim W.; and Lee, John Y., 4,599,435, Cl. 549-425.000.

Eue, Ludwig: *See*—
Forster, Heinz; Eue, Ludwig; and Schmidt, Robert R., 4,599,106, Cl. 71-100.000.
Thomas, Rudolf; Eue, Ludwig; Schmidt, Robert; and Lurssen, Klaus, 4,599,448, Cl. 564-214.000.

Evans, Alan G., to United States of America, Navy. Method for determining the orientation of a moving platform. 4,599,620, Cl. 343-357.000.

Evans, Arthur, to Wentworth Laboratories, Inc. Test probe assembly for IC chips. 4,599,559, Cl. 324-158.00P.

Evans, Carey: *See*—
LaBarbara, A. Franklin; Cann, Jeffrey; and Evans, Carey, 4,598,821, Cl. 206-329.000.

Evans, Donald S.: *See*—
Kleinberg, Larry K.; and Evans, Donald S., 4,598,710, Cl. 128-318.000.

Everett, Robert W. Indoor gun firing range enclosure. 4,598,631, Cl. 98-33.100.

Everitt, Brian T.: *See*—
Slapsys, Michael; and Everitt, Brian T., 4,598,521, Cl. 52-484.000.

Evers, Jack R.: *See*—
Furlong, Patrick J.; Evers, Jack R.; and Pike, Brian R., 4,599,008, Cl. 401-133.000.

Eversdyk, David A.: *See*—
McKinney, Osborne K.; Flores, David P.; and Eversdyk, David A., 4,599,392, Cl. 526-318.600.

Ex-Cell-O Corporation: *See*—
Nyland, Lloyd A.; and Klompmaker, Berend, 4,598,758, Cl. 164-154.000.

Exxon Chemical Patents Inc.: *See*—
Winston, William G.; and Groves, David M., 4,599,217, Cl. 422-53.000.

Exxon Research & Engineering Co.: *See*—
Cargle, Virgil H.; Robbins, Max L.; and Bock, Jan, 4,599,250, Cl. 427-220.000.
Duvdevani, Ilan; Schulz, Donald N.; Kitano, Kissho; and Peiffer, Dennis G., 4,599,377, Cl. 524-516.000.
Luton, Michael J., 4,599,214, Cl. 419-4.000.

F. L. Smidth & Co. A/S: *See*—
Cleemann, Jorgen, 4,598,873, Cl. 241-21.000.

FAFCO, Inc.: *See*—
Thompson, James R.; Armstrong, Errol C.; Wipfler, Richard T.; and Rhodes, Richard O., 4,598,450, Cl. 29-157.30V.

Faigl, Ferenc: *See*—
Foggassy, Elemer; Faigl, Ferenc; Soos, Rudolf; and Rakoczi, Jozsef, 4,599,444, Cl. 562-401.000.

Falckenberg, Richard; Grabmaier, Christa; and Grabmaier, Josef, to Siemens Aktiengesellschaft. Method large-area silicon bodies. 4,599,244, Cl. 427-74.000.

Falckenberg, Richard; Grabmaier, Christa; and Grabmaier, Josef, to Siemens Aktiengesellschaft. Method for making large-surface silicon crystal bodies. 4,599,245, Cl. 427-74.000.

Fan, You-Ling; Brode, George L.; and Rosen, Meyer R., to Union Carbide Corporation. High molecular weight water-soluble polymers and flocculation method using same. 4,599,390, Cl. 526-240.000.

Fang, Sheng, to Signetics Corporation. Byte wide EEPROM with individual write circuits and write prevention means. 4,599,707, Cl. 365-185.000.

Fantl, Jiri: *See*—
Kroupa, Petr; Sramek, Rudolf; and Fantl, Jiri, 4,598,537, Cl. 57-5.000.

Fanuc Ltd.: *See*—
Yamazaki, Etsuo, 4,599,022, Cl. 409-84.000.

Faraudo, Frank A.: *See*—
Faraudo, Julio P.; and Faraudo, Frank A., 4,598,500, Cl. 51-273.000.

Faraudo, Julio P.; and Faraudo, Frank A. Dust collector for air sander. 4,598,500, Cl. 51-273.000.

Farina, Samuel T.: *See*—
King, Peter F.; Farina, Samuel T.; and Korinek, Karl A., 4,599,116, Cl. 134-2.000.

Farona, Michael F.; and Kennedy, Joseph P., to University of Akron, The. Novel EPDM-isobutylene graft copolymers. 4,599,384, Cl. 525-245.000.

Farrar, David: *See*—
Flesher, Peter; Farrar, David; and Benson, Alan C., 4,599,379, Cl. 524-801.000.

Fay, Homer: *See*—
Werner, Robert G.; and Fay, Homer, 4,599,094, Cl. 55-26.000.

Federal-Mogul Corporation: *See*—
Thompson, Ronald J., 4,599,147, Cl. 204-15.000.

Fehr, Peter: *See*—
Stratil, Tomas; Pisinger, Milos; and Fehr, Peter, 4,598,858, Cl. 228-180.100.

Feiber, Wolfgang E. A.; Capp, Ronald J.; and Griffin, Dwight A., to AMP Incorporated. Apparatus for providing a continuous supply of workpieces. 4,599,026, Cl. 414-126.000.

Fejmert, Bernhard. Displacement pump for abrasive and difficult to pump fluids. 4,599,053, Cl. 417-437.000.

Felder, Christian, to Gebhardt Fordertechnik GmbH. Retarding conveyor for cargo with outward-transfer station. 4,598,814, Cl. 198-369.000.

Feller, Gilbert, to Metalem S.A. Decorated article, method of fabricating the same and substrates used in connection therewith. 4,599,251, Cl. 428-156.000.

Fencemender Corp.: *See*—
Chapman, Nicholas, 4,598,512, Cl. 52-165.000.

Fenwick, Robert, to Lieuse Technology Limited. Wheelchair. 4,598,921, Cl. 280-242.0WC.

Ferguson, George A.: *See*—
Gibson, William C.; Tomlinson, William M.; Goldstein, Eugene T.; and Ferguson, George A., 4,599,680, Cl. 361-386.000.
Fiat Auto S.p.A.: *See*—
Di Giusto, Nevio; and Cornacchia, Felice, 4,598,497, Cl. 49-374.000.
File Sharpening Company: *See*—
Whyde, George J., 4,598,447, Cl. 29-78.000.
FIN-TECH Limited Partnership: *See*—
Furlong, Patrick J.; Evers, Jack R.; and Pike, Brian R., 4,599,008, Cl. 401-133.000.
Fisch, Richard S., to Minnesota Mining and Manufacturing Company. Graphic arts imaging constructions using vapor-deposited layers. 4,599,298, Cl. 430-271.000.
Fischer, Hermann, to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft. Printing cylinder construction for sheet-fed offset rotary printing machine. 4,598,641, Cl. 101-246.000.
Fischer, Peter. Method of and apparatus for monitoring video-channel reception. 4,599,644, Cl. 358-84.000.
Fischer, Petra: *See*—
Winterholler, Johann; Plantsch, Josef; and Fischer, Petra, 4,598,850, Cl. 226-92.000.
Fischer, Rolf; Hoelderich, Wolfgang; Merger, Franz; Mross, Wolf D.; and Weitz, Hans-Martin, to BASF Aktiengesellschaft. Preparation of 2-methylalk-2-enals. 4,599,458, Cl. 568-450.000.
Fischer, William C.; Adams, Don L.; Wright, Stuart C.; and Verzella, David J., to United Technologies Corporation. Aircraft trim actuator shutdown monitor system and method. 4,599,698, Cl. 364-551.000.
Fisher, Kenneth W. J.; and Hare, Michael J., to P. J. Hare Limited. Self monitoring solid state switching system. 4,599,675, Cl. 361-173.000.
Fisnerova, Ludmila; Grimova, Jaroslava; Roubal, Zdenek; and Nemecek, Oldrich, to SPOFA, spojene podniky pro zdravotnickou vyrobu. 3-(2-(2-benzimidazolyl) benzolyloxyethyl)-4(3H)-quinazolinone. 4,599,415, Cl. 544-284.000.
Flammann, Norbert, to Robert Krups Stiftung & Co. KG. Household appliance with an adjustable guard for a rotary tool. 4,598,620, Cl. 83-399.000.
Flanagan, Caroline: *See*—
Smetaniuk, Terrace S., 4,599,508, Cl. 235-116.000.
Flasck, Richard A.: *See*—
Holmberg, Scott; and Flasck, Richard A., 4,599,705, Cl. 365-163.000.
Flechtner, Charles, to Compagnie Generale des Etablissements Michelin. Tire tread relief elements having undulated or broken line incisions. 4,598,747, Cl. 152-209.00R.
Fleishman, Roc V.: *See*—
Goldsmith, Alfred D.; and Fleishman, Roc V., 4,598,576, Cl. 73-19.000.
Flesher, Peter; Farrar, David; and Benson, Alan C., to Allied Colloids Ltd. Process for the production of polymers and aqueous solutions thereof. 4,599,379, Cl. 524-801.000.
Fletcher, Grant, to Redi-Go Farm Services (1980)Ltd. Self-levelling boom arrangement for an agricultural material distribution device. 4,598,830, Cl. 212-195.000.
Flickinger, Dale M.; and Flickinger, Mark D. Furnace with oscillating grate. 4,598,651, Cl. 110-280.000.
Flickinger, Mark D.: *See*—
Flickinger, Dale M.; and Flickinger, Mark D., 4,598,651, Cl. 110-280.000.
Flinn, John E.; and Korth, Gary E., to United States of America, Energy. Die-target for dynamic powder consolidation. 4,599,060, Cl. 425-1.000.
Flohrs, Peter, to Robert Bosch GmbH. Planar semiconductor structure breakdown voltage protection using voltage divider. 4,599,638, Cl. 357-51.000.
Flores, David P.: *See*—
McKinney, Osborne K.; Flores, David P.; and Eversdyk, David A., 4,599,392, Cl. 526-318.600.
Flotow, Richard A., to Dana Corporation. Noise suppression device for constant running clutch release bearing. 4,598,808, Cl. 192-98.000.
Flowerday, Carl W., to Prince Corporation. Vehicle armrest support. 4,598,948, Cl. 297-411.000.
Fluidcarbon International AB: *See*—
Stigsson, Lars L.; and Lindman, Bjorn, 4,599,089, Cl. 44-51.000.
FMC Corporation: *See*—
Brekke, Carroll E., 4,598,581, Cl. 73-117.300.
Young, Rickie A.; Willard, David L.; and Berger, Gerald P., 4,598,829, Cl. 212-149.000.
Foggassy, Elemer; Faigl, Ferenc; Soos, Rudolf; and Rakoczi, Jozsef, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Process for the separation of isomeric cyclopropane-carboxylic acids. 4,599,444, Cl. 562-401.000.
Foggini, Giovanni, to Lear S.n.c. di Foggini & C. Control lever, in particular a gearshift control lever for motor vehicles, and method for the manufacture thereof. 4,598,606, Cl. 74-523.000.
Foller, Werner, to Gestra Kondensatableiter GmbH & Co. Bimetallically controlled steam trap. 4,598,861, Cl. 236-59.000.
Fondazione Pro Juventute Don Carlo Gnocchi: *See*—
Pedotti, Antonio, 4,598,717, Cl. 128-779.000.
Ford Aerospace & Communications Corporation: *See*—
Chan, Fred N.; and Nilsen, Frank C., 4,599,697, Cl. 364-434.000.
Ford Motor Company: *See*—
Aposchanski, Alexander; Buglione, Arthur J.; Coats, James M.; and Edelman, Brian S., 4,599,694, Cl. 364-431.050.
Yen, Chia-Ming; Cole, Gerald S.; and Nowicki, Roman M., 4,598,754, Cl. 164-4.100.
Forner, Siegfried: *See*—
Weber, Robert; and Forner, Siegfried, 4,598,738, Cl. 138-89.000.
Forster, Dieter: *See*—
Dombrowski, Ferdinand; and Forster, Dieter, 4,598,584, Cl. 73-308.000.
Forster, Heinz; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Substituted alkanethiocarboxylic acid derivatives and herbicidal use thereof. 4,599,106, Cl. 71-100.000.
Foster, Donald D.; Hills, Robert N.; Moore, David G.; and Nelson, Phil L., to Realex Corporation. Take-up piston shipping lock for viscous product dispensers. 4,598,843, Cl. 222-153.000.
Foster, Karl: *See*—
Delvecchio, Robert M.; and Foster, Karl, 4,599,591, Cl. 335-215.000.
Foster Wheeler Energy Corporation: *See*—
Clamser, Christian J.; and Powers, Robert A., 4,598,670, Cl. 122-449.000.
Four Seasons Solar Products Corporation: *See*—
Esposito, Chris, 4,598,752, Cl. 160-272.000.
4 Square Motors: *See*—
Courtright, Harold D., 4,598,628, Cl. 91-481.000.
Fourrey, Francois; and Barnabe, Jean-Pierre, to Cycles Peugeot. Device for adjusting the relative inclination of two elements, and in particular of the seat base and seat back of an automobile seat. 4,598,947, Cl. 297-362.000.
Fourrey, Francois, to Cycles Peugeot. Tubular reinforcement in particular for a motor vehicle seat. 4,598,950, Cl. 297-452.000.
Fox, Charles L., Jr.; Modak, Shanta M.; and Fox, Paul, to Genetic Laboratories, Inc. Wound dressing comprising silver sulfadiazine incorporated in animal tissue and method of preparation. 4,599,226, Cl. 424-27.000.
Fox, Paul: *See*—
Fox, Charles L., Jr.; Modak, Shanta M.; and Fox, Paul, 4,599,226, Cl. 424-27.000.
Fox, Russell E.: *See*—
Kemeny, George A.; and Fox, Russell E., 4,599,671, Cl. 361-58.000.
Fragale, Carlo; Gargano, Michele; and Rossi, Michele, to Consiglio Nazionale Delle Ricerche. Process for the single-stage production of higher aliphatic ketones. 4,599,453, Cl. 568-387.000.
Framatome et Cogema: *See*—
Leclercq, Joseph; and Gagnard, Alain, 4,599,213, Cl. 376-446.000.
Franckowiak, Paul F.; and Mrotz, Walter C., III, to Haworth, Inc. Mechanical chair-height control mechanism. 4,598,892, Cl. 248-406.200.
Frank, Andrew A., to Aisin Seiki Kabushiki Kaisha. Low power control system and method for a power delivery system having a continuously variable ratio transmission. 4,598,611, Cl. 74-860.000.
Frank, Woodrow W., Jr.: *See*—
Alkire, Gerald R.; Frank, Woodrow W., Jr.; and Thompson, Robert W., 4,598,580, Cl. 73-104.000.
Franke, Eric; Kerber, Robert; and Langley, Marion D., to Briskin Manufacturing Company. Apparatus for sealing non-cylindrical tanks. 4,598,854, Cl. 228-48.000.
Franke, Wolfgang: *See*—
Schiebelhuth, Heinz; Franke, Wolfgang; Kahlcke, Hartwig; and Oppermann, Gunter, 4,599,003, Cl. 366-241.000.
Freeman, John T. Steering column protective jacket. 4,598,562, Cl. 70-237.000.
Friebel, Gottfried O.; and Kulfan, Robert M., to Boeing Company, The. Double parasol, favorable interference airplane. 4,598,886, Cl. 244-15.000.
Fried. Krupp Gesellschaft mit berschrankter Haftung: *See*—
Janssen, Wilhelm; and Ulrich, Klaus, 4,599,068, Cl. 432-97.000.
Fried. Krupp GmbH: *See*—
Kuhlmann, Herbert; and Rieger, Kurt, 4,598,667, Cl. 122-6.00A.
Friedman, Denis R.; and Goulston, Richard C. Filtration apparatus. 4,599,170, Cl. 210-223.000.
Frink, Attila; and Morrison, Robert A., to Lockheed Corporation. System for securing data within a computer. 4,598,964, Cl. 339-37.000.
Froeb, John W.; and Mondul, Donald D., to Illinois Tool Works Inc. Electrical encoding device. 4,599,605, Cl. 340-347.00P.
Fromme, Werner: *See*—
Glaubitz, Franz; Eis, Gunter; and Fromme, Werner, 4,598,718, Cl. 130-27.0AE.
Frommer, Jane E.; and Elsenbaumer, Ronald L., to Allied Corporation. Simultaneous polymerization, doping and solubilization of heterocyclic polymers, solutions and cast articles. 4,599,194, Cl. 252-518.000.
Frye, Kenneth G.; and Karis, Arthur T., to Beloit Corporation. Web guiding and decurling apparatus. 4,598,849, Cl. 226-21.000.
Fryer, Douglas M.; Hayes, Frederick W.; and Marshall, Richard S., to Sailing Foundation, The. Man overboard rescue system. 4,599,073, Cl. 441-80.000.
Fuchigami, Masao; and Matsuo, Yuichi, to Kabushiki Kaisha Komatsu Seisakusho. Method for making sand molds. 4,598,756, Cl. 164-37.000.
Fuchizawa, Tetsuro, to Fuji Photo Film Co., Ltd. Electrophotographic plate-making material. 4,599,288, Cl. 430-63.000.
Fuchs, Hugo, to BASF Aktiengesellschaft. Obtaining caprolactam from epsilon-aminocaproic acid. 4,599,199, Cl. 260-239.30A.
Fuji Electric Company Ltd.: *See*—
Hirota, Toshio; Tajima, Hiroyuki; and Sugiyama, Tomohiro, 4,599,282, Cl. 429-26.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Ohkumo, Hiroya; and Murakawa, Tsutomu, 4,598,679, Cl. 123-325.000.

Sakakiyama, Ryuzo, 4,598,806, Cl. 192-0.075.
Takahashi, Toshio, 4,599,696, Cl. 364-431.110.
Fuji Photo Film Co., Ltd.: *See—*
Fuchizawa, Tetsuro, 4,599,288, Cl. 430-63.000.
Ishizuka, Akio; Yamazaki, Hisashi; and Yamazaki, Kikuo, 4,599,539, Cl. 313-525.000.
Ohashi, Yuichi; and Ogawa, Tadashi, 4,599,301, Cl. 430-505.000.
Sakaguchi, Yukihiko; Aono, Toshiaki; and Fujita, Shinsaku, 4,599,296, Cl. 430-203.000.
Fuji Photo Optical Co., Ltd.: *See—*
Doi, Yoshikazu; Miyano, Hitoshi; Kishikawa, Toshiro; and Sunaga, Yasumasa, 4,598,980, Cl. 350-445.000.
Fuji Xerox Co., Ltd.: *See—*
Kurata, Masami; and Saitoh, Hiroyuki, 4,598,999, Cl. 356-380.000.
Saitoh, Koichi; Itami, Teruhiko; Kimoto, Toshifumi; and Nishimura, Nobuo, 4,599,658, Cl. 360-59.000.
Fujigiwa, Chikara; and Sasabe, Minoru, to Matsuo Kogyo Co., Ltd. Drag mechanism for a spinning reel. 4,598,879, Cl. 242-84.50R.
Fujii, Akira; Tokunaga, Tadatsugu; and Adachi, Hiroaki, to NEC Corporation. Video signal transmission systems. 4,599,648, Cl. 358-124.000.
Fujii, Setsuro; and Sakakibara, Eiichi, to Funai Pharmaceutical Ind., Ltd. 2-deoxy-5-fluorouridine derivative and a process for producing the same and an antitumor agent comprising the same. 4,599,404, Cl. 536-23.000.
Fujii, Yutaka; and Shinmoto, Takahiko, to Ryobi Ltd. Lateral perforation vertical registration device for offset press. 4,598,638, Cl. 101-76.000.
Fujimaki, Yoshihide; Takei, Yoshiaki; Suzuki, Yasuo; and Nomori, Hiroyuki, to Konishiroku Photo Industry Co., Ltd. Positive charging photoreceptor. 4,599,287, Cl. 430-59.000.
Fujimoto, Hirofumi: *See—*
Kawai, Nobuyasu; Hirano, Minoru; Manto, Hiromune; Esaka, Hajime; and Fujimoto, Hirofumi, 4,599,109, Cl. 75-238.000.
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., to International Flavors & Fragrances Inc. Ether carboxaldehydes. 4,599,468, Cl. 568-420.000.
Fujisawa Pharmaceutical Co.: *See—*
Kamiya, Takashi; Tanaka, Kunihiko; Teraji, Tsutomu; and Nakai, Yoshiharu, 4,599,426, Cl. 548-195.000.
Fujita, Shinsaku: *See—*
Sakaguchi, Yukihiko; Aono, Toshiaki; and Fujita, Shinsaku, 4,599,296, Cl. 430-203.000.
Fujitsu Limited: *See—*
Kanai, Yasunori; Sugiyama, Eiji; and Nawata, Kazumasa, 4,599,521, Cl. 307-455.000.
Shimozono, Ryoji; Ogawa, Yasunori; Tanaka, Yasuo; and Sano, Shigeo, 4,599,583, Cl. 332-9.00R.
Ueno, Kouji; and Miyamura, Tamio, 4,599,688, Cl. 365-189.000.
Fujiwara, Yoshio: *See—*
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Fukagawa, Hitoshi: *See—*
Komoda, Yoshiyuki; Fukagawa, Hitoshi; Suzuki, Yoshiharu; and Tanaka, Osamu, 4,599,598, Cl. 340-310.00A.
Fukami, Harukazu: *See—*
Kikumoto, Ryoji; Fukami, Harukazu; Hara, Hiroto; Ninomiya, Kunihiro; and Sugano, Mamoru, 4,599,419, Cl. 544-391.000.
Fukami, Masaharu; Terada, Atsusuke; and Hasegawa, Kazue, to Sankyo Company Limited. Ophthalmic anti-inflammatory agents. 4,599,360, Cl. 514-570.000.
Fukaya, Chikara: *See—*
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; and Suyama, Tadakazu, 4,599,343, Cl. 514-299.000.
Fukuda, Kazumasa: *See—*
Nakayama, Masatoshi; Morita, Haruyuki; Tokuoka, Yasumichi; Izumi, Toshiaki; Fukuda, Kazumasa; and Kubota, Yuichi, 4,599,266, Cl. 428-336.000.
Fukuda, Kunio: *See—*
Ueda, Sumio; and Fukuda, Kunio, 4,599,380, Cl. 525-68.000.
Fukuma, Yoshitaka; and Nakanishi, Tosaku, to Sharp Kabushiki Kaisha. Display drive without initial disturbed state of display. 4,599,613, Cl. 340-784.000.
Fukushima, Masakazu: *See—*
Shirai, Shoji; Yamauchi, Masaaki; Iidaka, Yoshiaki; Takano, Hiroshi; and Fukushima, Masakazu, 4,599,534, Cl. 313-414.000.
Funahashi, Yuichi: *See—*
Watanabe, Junichiro; and Funahashi, Yuichi, 4,599,440, Cl. 556-460.000.
Funai Electric Company Limited: *See—*
Funai, Tetsuro, 4,599,649, Cl. 358-148.000.
Funai Pharmaceutical Ind., Ltd.: *See—*
Fujii, Setsuro; and Sakakibara, Eiichi, 4,599,404, Cl. 536-23.000.
Funai, Tetsuro, to Funai Electric Company Limited. Synchronous circuit. 4,599,649, Cl. 358-148.000.
Funk, Gary L., to Phillips Petroleum Company. Control of a system for supplying heat. 4,598,669, Cl. 122-448.00R.
Furlong, Patrick J.; Evers, Jack R.; and Pike, Brian R., to FIN-TECH Limited Partnership. Fingernail polish capsule and plunger. 4,599,008, Cl. 401-133.000.
Furst, Zsuzsa: *See—*
Nogradi, Mihaly; Korbonits, Dezso ; Gottsegen, Agnes; Antus, Sandor; Furst, Zsuzsa; Knoll, Jozsef; Szejtli, Jozsef: Stadler, Agnes; Kovacs, Gabor; and Marmarosi, Katalin, 4,599,327, Cl. 514-58.000.
Furuhata, Takashi; Nakama, Taihei; Abe, Yuuhei; and Satoh, Kenji, to Hitachi, Ltd. Method and apparatus for detecting a phase or frequency error of a signal. 4,599,569, Cl. 328-111.000.
Furukawa, Yoshimi: *See—*
Serizawa, Mitsuya; Sano, Shoichi; and Furukawa, Yoshimi, 4,598,788, Cl. 180-140.000.
Furumi, Masatomo: *See—*
Yoshida, Isao; Okabe, Takeaki; Ochi, Shikayuki; Ito, Hidefumi; Furumi, Masatomo; Takeuchi, Masaru; and Nagata, Minoru, 4,599,576, Cl. 330-264.000.
Furumura, Kyozaburo; Sugi, Hiromi; Murakami, Yasuo; and Asai, Hiromitsu, to Nippon Seiko K.K. Sealing and bearing means by use of ferrofluid. 4,598,914, Cl. 277-80.000.
G. D. Searle & Co.: *See—*
Dickens, Jonathan P.; Donald, David K.; Kneen, Geoffrey; and McKay, William R., 4,599,361, Cl. 514-575.000.
Hansen, Donald W., Jr.; Mazur, Robert H.; and Pilipauskas, Daniel R., 4,599,325, Cl. 514-19.000.
G. D Societa' Per Azioni: *See—*
Mattei, Riccardo; and Belvederi, Bruno, 4,598,719, Cl. 131-84.100.
GA Technologies Inc.: *See—*
Whittemore, William L., 4,599,515, Cl. 250-390.000.
Gabric, John A.; and O'Neil, Edward F., to International Business Machines Corporation. Boosted phase driver. 4,599,520, Cl. 307-578.000.
Gabriel, Naeem B. Pelleted cigarette. 4,598,720, Cl. 131-335.000.
Gagliani, John; and Long, John V. Foaming and curing polyimide resins by application of microwave energy. 4,599,365, Cl. 521-56.000.
Gagnard, Alain: *See—*
Leclercq, Joseph; and Gagnard, Alain, 4,599,213, Cl. 376-446.000.
Gallatin, Norman W. Asymmetrical four-bar link trailer hitch. 4,598,926, Cl. 280-459.000.
Gamper, Howard B., Jr.: *See—*
Yabusaki, Kenichi K.; Isaacs, Stephen T.; and Gamper, Howard B., Jr., 4,599,303, Cl. 435-6.000.
Ganguli, Bimal N.: *See—*
Bajwa, Balbir S., deceased; Chatterjee, Dipak K.; Ganguli, Bimal N.; Reden, Jurgen; and de Souza, Noel J., 4,599,409, Cl. 544-126.000.
Gant, Lawrence A. Tire inflation/deflation system. 4,598,750, Cl. 152-416.000.
Ganz, Jorg, to SIG Societe Industrielle Suisse. Railway track tamper. 4,598,645, Cl. 104-12.000.
Garavaglia, Arthur E.: *See—*
McFarland, Timothy M.; and Garavaglia, Arthur E., 4,598,528, Cl. 53-430.000.
Gardes, Robert A. Flow line filter apparatus. 4,599,172, Cl. 210-314.000.
Gargano, Michele: *See—*
Fragale, Carlo; Gargano, Michele; and Rossi, Michele, 4,599,453, Cl. 568-387.000.
Garin de Lazcano, Jose I.: *See—*
Bilbao-Eguiguren, Jesua M.; and Garin de Lazcano, Jose I., 4,598,856, Cl. 228-131.000.
Garren, Lloyd R.; and Garren, Mary L. Endoscopic instrument for removing stomach insert. 4,598,699, Cl. 128-4.000.
Garren, Mary L.: *See—*
Garren, Lloyd R.; and Garren, Mary L., 4,598,699, Cl. 128-4.000.
Gartner, Karl, to Yoshida Kogyo K. K. Building wall construction. 4,598,513, Cl. 52-206.000.
Gaudino, Piero, to Officine Gaudino di P. Gaudino & C. S. a.s. Ring spinning or twisting machine having a device for the automatic and simultaneous removal of all full cops. 4,598,540, Cl. 57-278.000.
Gawel, Henry A.: *See—*
Horodysky, Andrew G.; Kaminski, Joan M.; Ashjian, Henry; and Gawel, Henry A., 4,599,183, Cl. 252-32.70E.
Gayer, Herbert; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, to Bayer Aktiengesellschaft. Novel thiolane-2,4-dione-3-carboxamide fungicides. 4,599,350, Cl. 514-445.000.
Gebhardt Fordertechnik GmbH: *See—*
Felder, Christian, 4,598,814, Cl. 198-369.000.
Geiger, Albert: *See—*
Riess, Guido; and Geiger, Albert, 4,599,085, Cl. 623-16.000.
Geil, James A.: *See—*
Agdanowski, Ronald T.; and Geil, James A., 4,598,707, Cl. 128-207.150.
Genentech, Inc.: *See—*
Wetzel, Ronald B., 4,599,197, Cl. 530-405.000.
General Dynamics Pomona Division: *See—*
Speer, Spencer J., 4,598,884, Cl. 244-3.160.
General Electric Co.: *See—*
Bluestein, Ben A., 4,599,374, Cl. 523-213.000.
Dimitroff, Vladimir T., Jr.; and Wagner, James B., 4,598,551, Cl. 60-646.000.
Kelly, Peter B.; and Heagle, Edward R., 4,599,124, Cl. 156-71.000.
Love, Robert P., 4,598,461, Cl. 29-571.000.
Lucas, Gary M., 4,599,394, Cl. 528-15.000.
Mark, Victor, 4,599,463, Cl. 568-723.000.
Odle, Roy R., 4,599,429, Cl. 548-481.000.
Policastro, Peter P., 4,599,393, Cl. 528-12.000.
Riley, James K.; and Miller-Jones, Stockton M., 4,598,589, Cl. 73-609.000.
Strok, Jack M., 4,599,543, Cl. 315-73.000.
Takekoshi, Tohru; and Anderson, Patricia P., 4,599,396, Cl. 528-185.000.
General Electric Company, Silicone Products Division: *See—*
Liu, Wan-Li, 4,599,381, Cl. 525-104.000.

General Instrument Corporation: *See—*
George, Ashok K.; and Jeffers, John, 4,599,647, Cl. 358-122.000.
Hill, Lawrence R., 4,599,607, Cl. 340-365.00R.
General Motors Corporation: *See—*
Compeau, Michael E.; and Rogers, Lloyd W., 4,598,932, Cl. 280-807.000.
Martin, Robert A., 4,599,544, Cl. 315-83.000.
McMahan, David R.; and Nicholas, Richard W., 4,599,681, Cl. 362-80.000.
General Semiconductor Industries, Inc.: *See—*
Roberts, Ronald L.; and Payne, Willard E., 4,599,636, Cl. 357-76.000.
Genetic Laboratories, Inc.: *See—*
Fox, Charles L., Jr.; Modak, Shanta M.; and Fox, Paul, 4,599,226, Cl. 424-27.000.
Genth, Hermann: *See—*
Oeckl, Siegfried; Schmitt, Hans-Georg; Paulus, Wilfried; and Genth, Hermann, 4,599,427, Cl. 548-262.000.
Geo Vann, Inc.: *See—*
Vann, Roy R., 4,598,771, Cl. 166-250.000.
George, Ashok K.; and Jeffers, John, to General Instrument Corporation. Receiver with interface for interaction with controller-decoder. 4,599,647, Cl. 358-122.000.
George, E. Victor, to United States of America, Energy. Raman laser with controllable suppression of parasitics. 4,599,725, Cl. 372-3.000.
Geo. Vann, Inc.: *See—*
Vann, Roy R.; and Colle, Edward A., Jr., 4,598,775, Cl. 175-4.600.
Gerhold, Bruce W., to Phillips Petroleum Company. Sulfur disposal. 4,599,160, Cl. 48-210.000.
Gerlach, Karl-Heinz; and Worner, Lothar, to Kautt & Bux KG. Process for production of commutator. 4,598,463, Cl. 29-597.000.
Germann, Albrecht J.: *See—*
Sauer, Hartmut K.; and Germann, Albrecht J., 4,598,642, Cl. 101-415.100.
Gerrard, Neil D.: *See—*
Mullin, John B.; Holliday, Arthur K.; Cole-Hamilton, David J.; Jones, Anthony C.; and Gerrard, Neil D., 4,599,150, Cl. 204-59.0QM.
Gerwick, B. Clifford, III: *See—*
Malhotra, Sudarshan K.; and Gerwick, B. Clifford, III, 4,599,105, Cl. 71-94.000.
Geschka, Hugo W., to E. Blum GmbH & Co. Laminated iron core for transformers, choke coils and the like. 4,599,595, Cl. 336-178.000.
Gesing, Adam J.: *See—*
Reeve, Martin R.; and Gesing, Adam J., 4,599,320, Cl. 501-96.000.
Gesslauer, Rudolf. Ozone drinking water purification apparatus. 4,599,166, Cl. 210-96.100.
Gestra Kondensatableiter GmbH & Co.: *See—*
Foller, Werner, 4,598,861, Cl. 236-59.000.
Ghiassi, Mohssen. Convenient and compact carry-on, garment bag luggage assembly. 4,598,803, Cl. 190-108.000.
Gibson, William C.; Tomlinson, William M.; Goldstein, Eugene T.; and Ferguson, George A., to Southwest Research Institute. Packaging arrangement for spacecraft computer. 4,599,680, Cl. 361-386.000.
Gilbert, Noel. Gasket seal between sewer pipe and manhole opening. 4,598,915, Cl. 277-207.00A.
Gilbert, Raymond: *See—*
Dutil, Robert; and Gilbert, Raymond, 4,598,920, Cl. 280-236.000.
Ginsburg, Stephen J.: *See—*
Ernest, Raymond; and Ginsburg, Stephen J., 4,598,437, Cl. 15-176.000.
Girard, Donald A. Ski locking device. 4,598,561, Cl. 70-58.000.
Giuliani, Raymond E.: *See—*
Mirra, Michael J.; Headrick, Jon W.; and Giuliani, Raymond E., 4,599,279, Cl. 428-658.000.
Glas, Friedrich. Plunger for a casting machine. 4,598,762, Cl. 164-312.000.
Glaspie, Robert L.: *See—*
Paul, Lawrence L.; and Glaspie, Robert L., 4,598,688, Cl. 124-41.00A.
Glaubitz, Franz; Eis, Gunter; and Fromme, Werner, to Claas OHG. Arrangement for uniform distribution of agricultural products in self-propelled harvester threshers and harvester thresher provided therewith. 4,598,718, Cl. 130-27.0AE.
Glover, John H.; Arnold, Edward J.; and Clissett, Peter A. G., to BWP Controls. Cable-and-sleeve connector. 4,598,809, Cl. 192-111.00A.
Gluck, Roland; Heilemann, Otto; and Bartsch, Gunter, to Daimler-Benz Aktiengesellschaft. Ventilating system on an internal-combustion engine. 4,598,671, Cl. 123-41.310.
Gohbara, Masatoshi: *See—*
Nakatani, Kiyoshi; Numata, Satoshi; Inoue, Tsuneo; Hosono, Akira; Oda, Kengo; Kubota, Yutaka; Tachibana, Hajime; Udagawa, Takatoshi; and Gohbara, Masatoshi, 4,599,362, Cl. 514-721.000.
Goldenberg, Barry: *See—*
Silver, Lester; and Goldenberg, Barry, 4,599,340, Cl. 514-277.000.
Goldsmith, Alfred D.; and Fleishman, Roc V., to National Technical Systems. Fluid detection device and method. 4,598,576, Cl. 73-19.000.
Goldstein, Eugene T.: *See—*
Gibson, William C.; Tomlinson, William M.; Goldstein, Eugene T.; and Ferguson, George A., 4,599,680, Cl. 361-386.000.
Gonczi, Csaba; Korbonits, Dezso ; Palosi, Endre; Kiss, Pal; Heja, Gergely; Kun, Judit; Szomor nee Wundele, Maria; Szvoboda nee Kanzel, Ida; Marvanyos, Ede; Horvath, Karoly; Kovacs nee Mindler, Vera; and Nagy nee Koranyi, Livia, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT. Process for the preparation of 5(6)-thio substituted benzimidazoles. 4,599,428, Cl. 548-306.000.
Gonzalez, Carlos F., to Microlife Technics, Inc. Preservation of foods with non-lactose fermenting *Streptococcus lactis* subspecies *diacetilactis*. 4,599,313, Cl. 435-253.000.
Good, Jonathan R. Magnetic-vacuum-cleaner attachment for picking up metal objects. 4,598,439, Cl. 15-339.000.
Goodlad, Albert P.; and De Stephanis, Ralph, to RCA Corporation. Article raising and lowering apparatus. 4,599,035, Cl. 414-697.000.
Goodman, C. Richard, to Dufresne, Raymond A.; Eberts, Terry R.; Ajeman, Matthew L.; and Haynes, Herbert E., Jr. Battery cable/connector assembly. 4,598,971, Cl. 339-228.000.
Goossens, John: *See—*
Podszun, Wolfgang; Witte, Josef; Uytterhoeven, Herman; and Goossens, John, 4,599,291, Cl. 430-114.000.
Gordian Systems, Inc.: *See—*
Cargile, William P., 4,599,489, Cl. 178-22.080.
Gordon, Gary; and Vincent, Kent, to Hewlett-Packard Company. High pressure meter pump. 4,599,049, Cl. 417-205.000.
Gore, Thomas: *See—*
Stanfield, Billy M., 4,598,492, Cl. 43-5.000.
Gottsegen, Agnes: *See—*
Nogradi, Mihaly; Korbonits, Dezso ; Gottsegen, Agnes; Antus, Sandor; Furst, Zsuzsa; Knoll, Jozsef; Szejtli, Jozsef; Stadler, Agnes; Kovacs, Gabor; and Marmarosi, Katalin, 4,599,327, Cl. 514-58.000.
Goulston, Richard C.: *See—*
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Goupillaud, Pierre L.; Morlet, Jean P.; and Grossmann, Alexandre, to Enelf Inc. Signal representation generator. 4,599,567, Cl. 324-77.00G.
Gozzo, Franco: *See—*
Bosone, Enrico; Caprara, Giuseppe; Corda, Francesco; Gozzo, Franco; Menconi, Augusto; Piccardi, Paolo; and Caprioli, Vincenzo, 4,599,358, Cl. 514-521.000.
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Gradeff, Peter S.; and Charte, Vincent J., to Rhone-Poulenc, Inc. Process for preparing ceric carboxylates. 4,599,201, Cl. 260-414.000.
Granberg, Dirk N., to A. O. Smith Corp. Radiant energy burner. 4,599,066, Cl. 431-329.000.
Grasse, Palmer, to Grasse, Palmer. Heavy duty scraper tool. 4,598,476, Cl. 30-169.000.
Gray, Robert B.: *See—*
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Grede Foundries Inc.: *See—*
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Green Cross Corporation, The: *See—*
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; and Suyama, Tadakazu, 4,599,343, Cl. 514-299.000.
Green, James W.: *See—*
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Greenleaf, James F. Apparatus and method for recording and displaying a three-dimensional image. 4,598,973, Cl. 350-3.600.
Greer, Stuart E.: *See—*
Dougherty, William E., Jr.; Greer, Stuart E.; and Sargent, Robert W., 4,598,470, Cl. 29-837.000.
Gregory, Reginald; and Westlake, David J., to British Petroleum Company P.L.C., The. Process for the transalkylation or dealkylation of alkyl aromatic hydrocarbons. 4,599,470, Cl. 585-323.000.
Grenier, Maurice: *See—*
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Griffin, Dwight A.: *See—*
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Griffith, Neil J., to Eastman Kodak Company. Inductively-coupled, thin-film M-R head. 4,599,668, Cl. 360-113.000.
Griffiths, Brian J.: *See—*
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Grimard, Jean P., to Becton, Dickinson and Company. Two-component syringe assembly. 4,599,082, Cl. 604-90.000.
Grimova, Jaroslava: *See—*
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Grinstein, Reuben H.: *See—*
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Groenendijk, Herman: *See—*
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Grohe, Klaus: *See—*
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Groshong, Frank E. Ceiling finish joint for dry wall partitions and method of making same. 4,598,516, Cl. 52-241.000.

Grossman, Richard F.; and McKane, Francis W., Jr., to Plastic Specialties and Technologies, Inc. Powdered elastomer dry blends and process for injection molding. 4,599,370, Cl. 523-200.000.

Grossmann, Alexandre: *See—*
Goupillaud, Pierre L.; Morlet, Jean P.; and Grossmann, Alexandre, 4,599,567, Cl. 324-77.00G.

Groves, David M.: *See—*
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Grube, Erwin; and Kuhlmann, Walter, to Durkoppwerke GmbH. Conveyer for suspended articles, e.g. garments. 4,598,812, Cl. 198-343.000.

Gruenfeld, Norbert: *See—*
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Grumman Aerospace Corporation: *See—*
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Grundhoff, Karl J.: *See—*
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Gruner, Donald E.: *See—*
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GTE Products Corporation: *See—*
Douglas, Alan D.; MacInnis, Martin B.; and Reilly, Kenneth T., 4,599,222, Cl. 423-49.000.
Douglas, Alan D.; Reilly, Kenneth T.; MacInnis, Martin B.; Powers, John A.; and Christini, James N., 4,599,223, Cl. 423-49.000.
Vanderpool, Clarence D.; and MacInnis, Martin B., 4,599,224, Cl. 423-606.000.

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Gunther, Wolfgang H. H., to Eastman Kodak Company. Oxachalcogenazole dyes and processes for their preparation. 4,599,410, Cl. 544-137.000.

Gus, Inc.: *See—*
Bennett, Robert P.; and Sokolove, Robert L., 4,599,249, Cl. 427-220.000.

Guterman, Daniel C., to Xicor, Inc. Nonvolatile electrically alterable memory. 4,599,706, Cl. 365-185.000.

Gutjahr, Lothar, to Klockner-Werke Aktiengesellschaft. Injection molding apparatus having die closing and locking means. 4,599,063, Cl. 425-150.000.

Gutknecht, Max. Screw extruder for reducing the volume of materials. 4,599,002, Cl. 366-85.000.

Gutleber, Frank S., to United States of America, Army. Multilevel noise code mate pair generation and utilization of such codes. 4,599,733, Cl. 375-25.000.

Ha Di Ho: *See—*
Rosenthal, Henry; and Kronhaus, Howard E., 4,598,534, Cl. 53-588.000.

Habegger, Willy: *See—*
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Hadley, Michael S.; and King, Francis D., to Beecham Group Ltd. Azabicyclic intermediates for pharmaceutical compounds. 4,599,420, Cl. 546-124.000.

Haendel, Richard S.; and Wauer, John C., to Rockwell International Corporation. Nearest return tracking in an FMCW system. 4,599,618, Cl. 343-7.500.

Haenssler, Gerd: *See—*
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Hafke, Carl: *See—*
Eichelsbacher, Michael; Kohlen, Rudolph; Reimert, Rainer; Hafke, Carl; and Schafer, Wolfgang, 4,599,092, Cl. 48-197.00R.

Hageman, John P. In situ roofing composite and method. 4,599,258, Cl. 428-140.000.

Hager, E. Randolph: *See—*
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Hahn, Benjamin A.; Kaufman, Richard A.; and Wesolowski, Alexander F., to Hoffmann-La Roche Inc. Photometric method for the determination of inorganic phosphate in liquid samples. 4,599,316, Cl. 436-105.000.

Hahn, Bernd D.: *See—*
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Halczenko, Wasyl; and Hartman, George D., to Merck & Co., Inc. Substituted and bridged pyridines useful as calcium channel blockers. 4,599,341, Cl. 514-282.000.

Halfacre, Mark A.: *See—*
Owens, Alexander H.; Halfacre, Mark A.; and Pan, David S., 4,598,460, Cl. 29-571.000.

Hall, Mark J.: *See—*
Tomalia, Donald A.; and Hall, Mark J., 4,599,400, Cl. 528-405.000.

Hallam, Kenneth L.; Howell, Barton J.; and Wilson, Mark E., to United States of America, National Aeronautics and Space Administration. Wide-angle flat field telescope. 4,598,981, Cl. 350-505.000.

Halliburton Company: *See—*
White, Billy W., 4,598,967, Cl. 339-89.00R.

Halliburton, Ronald D., to Arcade Engineering, Inc. Surface ball game apparatus. 4,598,910, Cl. 273-119.00A.

Haltof, Garry P.; Stephens, Eugene S.; and Czubachowski, Zygmunt J., to Caldwell Manufacturing Company. Jamb liner sash stop. 4,598,498, Cl. 49-407.000.

Hamaguchi, Masami; Taguchi, Toshio; Nozawa, Takamitsu; and Ogawa, Riichi, to Siseido Co., Ltd.; and Yoshino Kogyosho Co., Ltd. Sprayer cap structure. 4,598,865, Cl. 239-342.000.

Hamano, Sachiyuki: *See—*
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Hamer, Dean H.; Kaehler, Marian; and Leder, Philip. Protein from SV40 recombinants. 4,599,308, Cl. 435-68.000.

Hamlin, Jerry F. Dispensing apparatus. 4,598,664, Cl. 118-325.000.

Hammann, Ingeborg: *See—*
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Hammond, John A. G.: *See—*
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Han, Yu-Pin; and Chan, Tsiu C., to Mostek Corporation. Method of making MOSFET by multiple implantations followed by a diffusion step. 4,599,118, Cl. 148-1.500.

Hanano, Masamitsu; and Saito, Chuichi, to Hitachi, Ltd. Balustrade for a passenger conveyor. 4,598,811, Cl. 198-335.000.

Hancart, Lucien: *See—*
Dewinck, Jean; and Hancart, Lucien, 4,598,464, Cl. 29-597.000.

Haneda, Satoshi; Shoji, Hisashi; and Hiratsuka, Seiichiro, to Konishiroku Photo Industry Co., Ltd. Multiplex image reproducing method. 4,599,285, Cl. 430-54.000.

Hanert, John A. Closet rod racket and ball holder. 4,598,891, Cl. 248-340.000.

Hanniala, Teuvo P. T., to Outokumpu, Oy. Method for processing sulphide concentrates and sulphide ores into raw material. 4,599,108, Cl. 75-73.000.

Hansen, Donald W., Jr.; Mazur, Robert H.; and Pilipauskas, Daniel R., to G. D. Searle & Co. Substituted tyrosyl alanine dipeptide amides. 4,599,325, Cl. 514-19.000.

Hansjurgens, Achim; and Mionskowski, Gerhard, to Deutsche Nemectron GmbH. Electrostimulation therapy device and method. 4,598,713, Cl. 128-421.000.

Hanson, David R., to United States of America, Interior. Detached rock evaluation device. 4,598,588, Cl. 73-584.000.

Hanssler, Gerd: *See—*
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Schmetzer, Johannes; Stetter, Jorg; Reinecke, Paul; and Hanssler, Gerd, 4,599,348, Cl. 514-383.000.

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Harada, Denzaburo, to Kubota, Ltd. Power transmission control apparatus. 4,598,545, Cl. 60-435.000.

Harajiri, Toshihiko; Motte, Shunichi; and Shinbo, Masafumi, to Seiko Instruments & Electronics Ltd. Method of producing liquid-crystal display device. 4,599,246, Cl. 427-86.000.

Harara, Mitsuhiko: *See—*
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Hare, Michael J.: *See—*
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Hareng, Michel: *See—*
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Hargis, Duane C., to Ethyl Corporation. Catalytic alkylation of aromatic amines with alkanols. 4,599,449, Cl. 564-409.000.

Harkness, John C.: *See—*
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Harlan, Wayne E., to RCA Corporation. Apparatus responsive to plural color video signals for amplitude limiting the video signals to assist beam current limiting. 4,599,643, Cl. 358-74.000.

Harrer, Josef: *See—*
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Harrington, John H.: *See—*
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Harris Corporation: *See—*
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Harris, James J.: *See—*
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Harry Major Machine & Tool Co.: *See—*
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Hart, Colin O.: *See—*
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Hart, William W. C.; and Korcz, William H., to Shell Oil Company. High heat, sound damping metal-polymer laminate. 4,599,261, Cl. 428-213.000.

Hartle, Ronald J., to Nordson Corporation. Multiple process electrostatic spray gun having integral power supply. 4,598,871, Cl. 239-706.000.

Hartman, George D.: *See—*
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Hartman, Kathy J.: *See*—
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Hartmann, Clinton S.; and Wright, Peter, to R. F. Monolithics, Inc. Impedance element. 4,599,587, Cl. 333-176.000.
Hartshorne, Frank A.: *See*—
Keigler, John E.; and Hartshorne, Frank A., 4,599,619, Cl. 343-352.000.
Harvey, Debra A.; Kean, Walter F.; and Lock, Colin J. L., to Canadian Patents and Development Limited. Forms of aurothiomalate having therapeutic advantage. 4,599,436, Cl. 556-114.000.
Harwig, Hendrik A.: *See*—
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Harwood, Michael E.: *See*—
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Hashimoto, Hidekichi: *See*—
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Haupt, Randy L., to United States of America, Air Force. Phase only adaptive nulling in a monopulse antenna. 4,599,622, Cl. 343-427.000.
Hauptmann, Andreas: *See*—
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Haus, John C., Jr., to U.S. Truck Cranes, Inc. Rolling base for truck cranes. 4,599,032, Cl. 414-542.000.
Hausman, Mary L.; Miller, Gerald D.; and Wempe, Lawrence K., to Air Products and Chemicals, Inc. Vinyl acetate copolymer emulsions for paper coating compositions. 4,599,378, Cl. 524-554.000.
Havemann, Robert H.: *See*—
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Havkin, Michael; Orleansky, Eda; and Samson, Claude. Polarizer reflector and reflecting plate scanning antenna including same. 4,599,623, Cl. 343-756.000.
Hawkins, Edwin F., to Arcadian Corporation. Triazone fertilizer and method of making. 4,599,102, Cl. 71-30.000.
Hawkins, Ronald B.: *See*—
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Haworth, Inc.: *See*—
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Hayasaka, Akio: *See*—
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Hayase, Shuzi: *See*—
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Hayashi, Akira; Hirota, Yutaka; and Tanaka, Mitsuhiro, to Mitsui Petrochemical Industries, Ltd. Metal-deposited paper and method for production thereof. 4,599,275, Cl. 428-461.000.
Hayashi, Saburo; Mukai, Mitsukazu; Inoue, Masahiro; Tsuchiya, Hiroo; Otsuji, Akira; and Tanabe, Takeo, to Seitetsu Kagaku Co., Ltd. Process for removal of mercury from waste water. 4,599,177, Cl. 210-718.000.
Hayashi, Tsutomu, to Honda Giken Kogyo Kabushiki Kaisha. Dual braking device for motorcycle. 4,598,954, Cl. 303-6.00A.
Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Automotive engine with knock sensor. 4,598,681, Cl. 123-425.000.
Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Intercooler for supercharged internal combustion engine. 4,598,687, Cl. 123-563.000.
Hayashida, Hiroshi: *See*—
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Hegel, Robert W.; and VanAppledorn, William, to Prince Corporation. Die clamping device. 4,598,574, Cl. 72-481.000.
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Held, Kurt. Method of profiling metal strips. 4,598,564, Cl. 72-111.000.
Held, Kurt. Process and apparatus for the continuous production of metal-clad laminates. 4,599,128, Cl. 156-322.000.
Heller, Jurg; Kissling, Bruno; Robinson, Tibor; and Valenti, Salvatore, to Sandoz Ltd. Treatment of textile materials to improve the fastness of dyeings made thereon. 4,599,087, Cl. 8-495.000.
Helms, Charles: *See*—
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Hemmings, David T., to Megatool Inc. Drill bit carrying case. 4,598,822, Cl. 206-379.000.
Hemotec, Inc.: *See*—
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Henkel Corporation: *See*—
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Henkel Kommanditgesellschaft auf Aktien: *See*—
Wuhrmann, Juan C.; Brands, Karl D.; Mueller, Heinz; Schumann, Klaus; and Altenschoepfer, Theodor, 4,599,189, Cl. 252-174.150.
Henne, Heinrich; Lohnherr, Ludger; Rittscher, Peter; and Holz, Walter, to Krupp Polysius AG. Method of operating grinding apparatus and grinding apparatus operating according to this method. 4,598,872, Cl. 241-19.000.
Henning, Georg: *See*—
Lotsch, Wolfgang; and Henning, Georg, 4,599,113, Cl. 106-288.00Q.
Henry, Richard D. Bank and pitch indicator. 4,598,582, Cl. 73-178.00R.
Hepworth, Malcolm T., to Amax Inc. Coal combustion to produce clean low-sulfur exhaust gas. 4,598,652, Cl. 110-345.000.
Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government: *See*—
Schattschneider, George K., 4,599,146, Cl. 204-1.00T.
Herbelleau, Yves: *See*—
Campos, Francis; and Herbelleau, Yves, 4,598,748, Cl. 152-209.00R.
Hercules Incorporated: *See*—
Clayton, Anthony B.; and Kramer, Brian D., 4,599,385, Cl. 525-285.000.
Hermann, Bernd: *See*—
Michalak, Stanislaw; and Hermann, Bernd, 4,598,766, Cl. 165-104.160.
Herr, James E., to Kerr Glass Manufacturing Corporation. Tamper-evident child-resistant closure. 4,598,833, Cl. 215-220.000.
Herrandez, Jorge M., to Rogers Corporation. High capacitance bus bar including multilayer ceramic capacitors. 4,599,486, Cl. 174-72.00B.
Herrando Villanueva, Eliseo. Apparatus for forming flat elements, such as tiles, into packages. 4,598,532, Cl. 53-542.000.
Herrelko, Edward J.; Hurley, James E.; and Day, William J., to Raytheon Company. Gas oven with recessed broil burner. 4,598,691, Cl. 126-41.00R.
Herrig, Friedhelm: *See*—
Neubuser, Siegmar; Dose, Peter; and Herrig, Friedhelm, 4,599,039, Cl. 414-786.000.
Hersemeyer, Klaus; and Pietrzok, Klaus-Peter, to Wegmann & Co. GmbH. Ammunition-stowage system in which the individual shells can be inserted in storage tubes. 4,598,623, Cl. 89-34.000.
Hershey Foods Corporation: *See*—
Leeper, Lloyd C.; and Mullen, C. Thomas, 4,598,619, Cl. 83-117.090.
Hertel, Hasso, to Hoechst Aktiengesellschaft. Process for the preparation of acid nitro dyestuffs. 4,599,450, Cl. 564-433.000.
Herter, Rolf: *See*—
Schickaneder, Helmut; Postius, Stefan; Herter, Rolf; Morsdorf, Peter; Szelenyi, Istvan; and Ahrens, Kurt H., 4,599,346, Cl. 514-317.000.
Herzog, Hans K.; and Sakurai, Seiya, to Boeing Company, The. Avionic control system. 4,598,890, Cl. 244-230.000.
Hewlett-Packard Company: *See*—
Gordon, Gary; and Vincent, Kent, 4,599,049, Cl. 417-205.000.
Hexcel Corporation: *See*—
Moulton, Richard J.; and Neuner, John D., 4,599,413, Cl. 544-231.000.
Hey, David G., to Imperial Chemical Industries PLC. Cleaning compositions based on trichlorotrifluoroethane and alcohols. 4,599,187, Cl. 252-171.000.

Heywang, Gerhard; Reinecke, Paul; Brandes, Wilhelm; Haenssler, Gerd; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. Carbamoylated azolylalkyl-phenoxy-carbinols and their use as plant-protection agents. 4,599,349, Cl. 514-383.000.

Hickman, John B., to W. P. Hickman Company. Roof edge construction. 4,598,507, Cl. 52-94.000.

Hidaka, Tohoru: *See—*
Misato, Tomomasa; Homma, Yasuo; Arimoto, Yutaka; Hidaka, Tohoru; and Yuda, Mitsuhara, 4,599,233, Cl. 424-127.000.

Hidler, Henry T.; Hope, Lawrence L.; Davey, Ernest A.; and Schrank, Martin P. Electroluminescent display device. 4,599,538, Cl. 313-512.000.

Hiestand, Karl, to S M W Schneider & Weisshaupt GmbH. Power chuck, particularly for turning machines. 4,598,917, Cl. 279-1.00J.

Highsmith, Albert E., to Dresser Industries, Inc. Rotary rock bit ball plug. 4,598,778, Cl. 175-371.000.

Higuchi, Takeo: *See—*
Asaoka, Yoshitaka; Higuchi, Takeo; and Kuji, Yoshiharu, 4,598,868, Cl. 239-659.000.

Hilbig, Herbert H. Electrolytic pool chlorinator having distribution chamber for filling anode and cathode chambers. 4,599,159, Cl. 204-266.000.

Hileman, Ronald E. Doppler method and apparatus for measuring fluid motion. 4,598,716, Cl. 128-663.000.

Hill, Lawrence R., to General Instrument Corporation. Acoustic keyboard. 4,599,607, Cl. 340-365.00R.

Hill, William H., to Hughes Aircraft Company. Open-center flexural pivot wire bonding head. 4,598,853, Cl. 228-4.500.

Hills, Robert N.: *See—*
Foster, Donald D.; Hills, Robert N.; Moore, David G.; and Nelson, Phil L., 4,598,843, Cl. 222-153.000.

Himori, Norio: *See—*
Yasuda, Kikuo; Takezaki, Takayuki; Ohuchi, Rikio; Ohuyabu, Hiroshi; Tanimoto, Yoshitaka; Seki, Toshimi; Yamaguchi, Takashi; Izumi, Akihiro; Himori, Norio; and Ishimori, Tsutomu, 4,599,333, Cl. 514-247.000.

Hines, Jesse M.: *See—*
Bowker, Roger S.; Olsen, Linda J.; and Hines, Jesse M., 4,599,611, Cl. 340-721.000.

Hinn, Werner, to RCA Corporation. Kinescope driver with high frequency compensation. 4,599,655, Cl. 358-242.000.

Hiramitsu, Tetsushi; Sugita, Hiroshi; and Ono, Satoshi, to Toyoda Gosei Co., Ltd. Steering wheel. 4,598,603, Cl. 74-484.00R.

Hirano, Minoru: *See—*
Kawai, Nobuyasu; Hirano, Minoru; Manto, Hiromune; Esaka, Hajime; and Fujimoto, Hirofumi, 4,599,109, Cl. 75-238.000.

Hiratsuka, Seiichiro: *See—*
Haneda, Satoshi; Shoji, Hisashi; and Hiratsuka, Seiichiro, 4,599,285, Cl. 430-54.000.

Hirose, Masanao. Method for the ultrasonic treatment of a dilute alcoholic solution. 4,599,459, Cl. 568-471.000.

Hirota, Toshio; Tajima, Hiroyuki; and Sugiyama, Tomohiro, to Fuji Electric Company Ltd. Fuel cell. 4,599,282, Cl. 429-26.000.

Hirota, Yutaka: *See—*
Hayashi, Akira; Hirota, Yutaka; and Tanaka, Mitsuhiro, 4,599,275, Cl. 428-461.000.

Hishikari, Isao; and Ide, Toshihiko, to Chino Works, Ltd. Temperature control system for a blackbody furnace. 4,599,507, Cl. 219-486.000.

Hitachi, Ltd.: *See—*
Furuhata, Takashi; Nakama, Taihei; Abe, Yuuhei; and Satoh, Kenji, 4,599,569, Cl. 328-111.000.
Hanano, Masamitsu; and Saito, Chuichi, 4,598,811, Cl. 198-335.000.
Hombu, Mitsuyuki; Ueda, Shigeta; Suzuki, Katsunori; and Matsuda, Yasuo, 4,599,685, Cl. 363-41.000.
Itoh, Kazuo; Ogiue, Katsumi; and Hayasaka, Akio, 4,599,635, Cl. 357-44.000.
Kaji, Hiroyuki; and Nitta, Yoshihiko, 4,599,612, Cl. 340-723.000.
Kimura, Takeshi; Obayashi, Hidehito; and Mochiji, Kozo, 4,599,737, Cl. 378-35.000.
Matsuoka, Shigeru, 4,599,608, Cl. 340-365.00S.
Miyao, Masanobu; Ohkura, Makoto; Takemoto, Iwao; and Tamura, Masao, 4,599,133, Cl. 156-617.00R.
Mutoh, Nobuyoshi; Sakai, Keijiro; Ueda, Akiteru; Ishibashi, Akira; and Okajima, Ikuo, 4,599,549, Cl. 318-798.000.
Saito, Isao; Ishibashi, Yoji; Ohmori, Takashi; Minakawa, Yoshimitsu; and Kuroda, Michio, 4,598,553, Cl. 60-733.000.
Sasaki, Yoshimitsu; Kajimura, Takashi; Chinone, Naoki; and Nakamura, Michiharu, 4,599,729, Cl. 372-49.000.
Shirai, Shoji; Yamauchi, Masaaki; Iidaka, Yoshiaki; Takano, Hiroshi; and Fukushima, Masakazu, 4,599,534, Cl. 313-414.000.
Takahashi, Tadashi; Miyashita, Kunio; and Hayashida, Hiroshi, 4,599,561, Cl. 324-208.000.
Taya, Shunroku; Koike, Takeshi; and Komatsu, Mitsuo, 4,599,516, Cl. 250-443.100.
Tsunekawa, Sukeyoshi; Homma, Yoshio; Morisaki, Hiroshi; Okudaira, Sadayuki; and Mukai, Kiichiro, 4,599,135, Cl. 156-643.000.
Yoshida, Isao; Okabe, Takeaki; Ochi, Shikayuki; Ito, Hidefumi; Furumi, Masatomo; Takeuchi, Masaru; and Nagata, Minoru, 4,599,576, Cl. 330-264.000.

Hitch, Robert J., to W. C. Bradley Company. Universal gas burner and dual adjustable flexible venturi tube arrangement for gas barbeque grills. 4,598,692, Cl. 126-41.00R.

Hladky, Walter; DeVito, Ralph J.; and Hoffman, Louis S., to Control Interface Company Limited. Aircraft simulator and simulated control system therefor. 4,599,070, Cl. 434-45.000.

Ho, Benedict C. M., to NCR Canada Ltd-NCR Canada LTEE. Fine-coarse positioning control system with easy adjustment. 4,599,547, Cl. 318-594.000.

Hochiki Corporation: *See—*
Tsuji, Toshihide; Ioka, Yoshinori; Anzai, Hisatugu; Kasahara, Noboru; and Katagiri, Fujio, 4,598,494, Cl. 49-2.000.

Hocking, Warwick P., to Tu-Fit (Proprietary) Limited. Anchoring device. 4,599,010, Cl. 403-191.000.

Hodek, Robert B.; and Seiner, Jerome A., to PPG Industries, Inc. A method of molding polymerizable composition comprising lactam monomer, catalyst and initiator. 4,599,398, Cl. 528-312.000.

Hodge, Dean R.; and Culler, Daryl L. Film developing tube. 4,598,988, Cl. 354-312.000.

Hodogaya Chemical Co., Ltd.: *See—*
Misato, Tomomasa; Homma, Yasuo; Arimoto, Yutaka; Hidaka, Tohoru; and Yuda, Mitsuhara, 4,599,233, Cl. 424-127.000.

Hoechst Aktiengesellschaft: *See—*
Bajwa, Balbir S., deceased; Chatterjee, Dipak K.; Ganguli, Bimal N.; Reden, Jurgen; and de Souza, Noel J., 4,599,409, Cl. 544-126.000.
Hertel, Hasso, 4,599,450, Cl. 564-433.000.
Kohaut, Gunter; Weber, Werner; Groenendijk, Herman; Poppelaars, Adrianus C.; and Janssen, Wilhelmus H. J., 4,599,269, Cl. 428-397.000.
Lachhein, Stephen; and Mildenberger, Hilmar, 4,599,207, Cl. 558-137.000.
Schiessler, Siegfried; and Spietschka, Ernst, 4,599,431, Cl. 549-232.000.
Spietschka, Ernst; and Troster, Helmut, 4,599,408, Cl. 544-125.000.

Hoelderich, Wolfgang: *See—*
Fischer, Rolf; Hoelderich, Wolfgang; Merger, Franz; Mross, Wolf D.; and Weitz, Hans-Martin, 4,599,458, Cl. 568-450.000.

Hoelzl, Klaus, to TMC Corporation. Anti-theft lock for skis. 4,598,933, Cl. 280-809.000.

Hoenninger, John C., III; Crooks, Lawrence E.; and Arakawa, Mitsuaki, to University of Calif., The Regents of the. Method and apparatus for rapid NMR imaging using multi-dimensional reconstruction techniques. 4,599,565, Cl. 324-309.000.

Hoffarth, Joseph G.: *See—*
Babu, Suryadevara V.; Hoffarth, Joseph G.; and Welsh, John A., 4,599,134, Cl. 156-626.000.

Hoffman, Klaus-Peter, to Colgate-Palmolive Company. Tag for a container. 4,598,489, Cl. 40-310.000.

Hoffman, Louis S.: *See—*
Hladky, Walter; DeVito, Ralph J.; and Hoffman, Louis S., 4,599,070, Cl. 434-45.000.

Hoffmann, Gerhard: *See—*
Eckell, Albrecht; Elzer, Albert; Hoffmann, Gerhard; Leyrer, Reinhold J.; and Werther, Heinz-Ulrich, 4,599,293, Cl. 430-126.000.
Russemeyer, Hans; Pollak, Karl-Heinz; and Hoffmann, Gerhard, 4,599,017, Cl. 406-95.000.

Hoffmann-La Roche Inc.: *See—*
Boris, Alfred; Partridge, John J.; and Uskokovic, Milan R., 4,599,330, Cl. 514-167.000.
Carson, Matthew; Le Mahieu, Ronald A.; Nason, William C.; and Tilley, Jefferson W., 4,599,336, Cl. 514-259.000.
Chan, Ka-Kong; Holland, George W.; and Rosen, Perry, 4,599,443, Cl. 560-219.000.
Hahn, Benjamin A.; Kaufman, Richard A.; and Wesolowski, Alexander F., 4,599,316, Cl. 436-105.000.
Kompis, Ivan, 4,599,416, Cl. 544-296.000.
Krasso, Anna; and Ramuz, Henri, 4,599,347, Cl. 514-338.000.

Hofmann, Peter-Jurgen, to Kraftwerk Union Aktiengesellschaft. Pairing of materials for highly stressed machine parts. 4,599,278, Cl. 428-591.000.

Hohmann Enterprises, Inc.: *See—*
Hohmann, Ronald P., 4,598,518, Cl. 52-410.000.

Hohmann, Ronald P., to Hohmann Enterprises, Inc. Pronged veneer anchor and dry wall construction system. 4,598,518, Cl. 52-410.000.

Holland, George W.: *See—*
Chan, Ka-Kong; Holland, George W.; and Rosen, Perry, 4,599,443, Cl. 560-219.000.

Holliday, Arthur K.: *See—*
Mullin, John B.; Holliday, Arthur K.; Cole-Hamilton, David J.; Jones, Anthony C.; and Gerrard, Neil D., 4,599,150, Cl. 204-59.0QM.

Hollingsworth, Alexander; and Jones, Stephen H., to Nordson Corporation. Skin packaging machine with temperature sensing probe. 4,598,527, Cl. 53-427.000.

Holmberg, Scott; and Flasck, Richard A., to Energy Conversion Devices, Inc. Programmable cell for use in programmable electronic arrays. 4,599,705, Cl. 365-163.000.

Holmes, Billy G., to Mobil Oil Corporation. Method for operating a production well in an oxygen driven in-situ combustion oil recovery process. 4,598,772, Cl. 166-251.000.

Holmstrom, Goran: *See—*
Bergman, Carl; Holmstrom, Goran; and Nygard, Arne, 4,598,573, Cl. 72-455.000.

Holtzhauser, Joseph C.: *See—*
Nellums, Richard A.; Braun, Eugene R.; and Holtzhauser, Joseph C., 4,598,609, Cl. 74-650.000.

Holz, Walter: *See—*
Henne, Heinrich; Lohnherr, Ludger; Rittscher, Peter; and Holz, Walter, 4,598,872, Cl. 241-19.000.

Hombu, Mitsuyuki; Ueda, Shigeta; Suzuki, Katsunori; and Matsuda, Yasuo, to Hitachi, Ltd. Control circuit for power converter apparatus. 4,599,685, Cl. 363-41.000.

Homma, Yasuo: *See*—
Misato, Tomomasa; Homma, Yasuo; Arimoto, Yutaka; Hidaka, Tohoru; and Yuda, Mitsuhara, 4,599,233, Cl. 424-127.000.

Homma, Yoshio: *See*—
Tsunekawa, Sukeyoshi; Homma, Yoshio; Morisaki, Hiroshi; Okudaira, Sadayuki; and Mukai, Kiichiro, 4,599,135, Cl. 156-643.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hayashi, Tsutomu, 4,598,954, Cl. 303-6.00A.
Serizawa, Mitsuya; Sano, Shoichi; and Furukawa, Yoshimi, 4,598,788, Cl. 180-140.000.
Uesugi, Naomoto; and Suzuki, Shoji, 4,598,790, Cl. 181-252.000.

Honda, Michitaka: *See*—
Kikuchi, Katsuya; and Honda, Michitaka, 4,599,742, Cl. 378-099.000.

Honeywell Inc.: *See*—
Barnes, David A.; and Szonntagh, Eugene L., 4,599,095, Cl. 55-208.000.
Beckey, Thomas J., 4,598,764, Cl. 165-29.000.
Planer, Norman G.; and Zansky, Zoltan, 4,599,672, Cl. 361-92.000.

Honkanen, Erkki J.: *See*—
Marvola, Martti L. A.; Marttila, Esko V.; Uotila, Jaakko A.; Pippuri, Aino K.; Kairisalo, Pekka J.; and Honkanen, Erkki J., 4,599,326, Cl. 514-29.000.

Hood, Charles T., Jr.: *See*—
Bell, Richard S.; and Hood, Charles T., Jr., 4,598,855, Cl. 228-52.000.

Hoofe, William J., III. Interlocking panels. 4,598,522, Cl. 52-555.000.

Hooven, Michael D.: *See*—
Cummings, Joel; and Hooven, Michael D., 4,598,579, Cl. 73-37.000.

Hoover, Dennis J., to Pfizer Inc. Intermediates in polypeptide synthesis. 4,599,198, Cl. 260-998.200.

Hope, Lawrence L.: *See*—
Hidler, Henry T.; Hope, Lawrence L.; Davey, Ernest A.; and Schrank, Martin P., 4,599,538, Cl. 313-512.000.

Hopkins, David. Child's car seat with attachment for shopping cart. 4,598,945, Cl. 280-250.000.

Hoppe, Karl-Heinz, to Robert Bosch GmbH. Wide band constant duty cycle pulse train processing circuit. 4,599,736, Cl. 375-110.000.

Horodysky, Andrew G.; Kaminski, Joan M.; Ashjian, Henry; and Gawel, Henry A., to Mobil Oil Corporation. Multifunctional additives. 4,599,183, Cl. 252-32.70E.

Horodysky, Andrew G., to Mobil Oil Corporation. Friction reducing additives and compositions thereof. 4,599,191, Cl. 252-32.500.

Horvath, Karoly: *See*—
Gonczi, Csaba; Korbonits, Dezso ; Palosi, Endre; Kiss, Pal; Heja, Gergely; Kun, Judit; Szomor nee Wundele, Maria; Szvoboda nee Kanzel, Ida; Marvanyos, Ede; Horvath, Karoly; Kovacs nee Mindler, Vera; and Nagy nee Koranyi, Livia, 4,599,428, Cl. 548-306.000.

Hosiden Electronics Co., Ltd.: *See*—
Takihara, Yukio, 4,598,970, Cl. 339-183.000.

Hosokawa, Minoru: *See*—
Kawamura, Yoshikazu; Hosokawa, Minoru; Okazaki, Sakiho; and Ishii, Hiroshi, 4,599,005, Cl. 368-157.000.

Hosono, Akira: *See*—
Nakatani, Kiyoshi; Numata, Satoshi; Inoue, Tsuneo; Hosono, Akira; Oda, Kengo; Kubota, Yutaka; Tachibana, Hajime; Udagawa, Takatoshi; and Gohbara, Masatoshi, 4,599,362, Cl. 514-721.000.

Hosoya, Masahiro; Uehara, Tsutomu; and Nosaki, Takefumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Developing device. 4,598,991, Cl. 355-3.0DD.

Hospal Industrie: *See*—
Chevallet, Jacques, 4,599,165, Cl. 210-87.000.

Howell, Barton J.: *See*—
Hallam, Kenneth L.; Howell, Barton J.; and Wilson, Mark E., 4,598,981, Cl. 350-505.000.

HRI Associates, Inc.: *See*—
Yabusaki, Kenichi K.; Isaacs, Stephen T.; and Gamper, Howard B., Jr., 4,599,303, Cl. 435-6.000.

HSC Research Development Corporation: *See*—
Shami, Yehezkel, 4,599,314, Cl. 435-287.000.

Hsu, Song K.: *See*—
Billig, Ernst; Abatjoglou, Anthony G.; Bryant, David R.; Murray, Rex E.; Mather, John M.; and Hsu, Song K., 4,599,059, Cl. 418-236.000.

Hsu, Wen-Cheng; Wu, Chin-Jia; and Kuo, Shuen-Liang. Electrical hydraulic jack. 4,598,898, Cl. 254-93.00H.

Hsu, Wen Y. Collapsible camp stove. 4,598,690, Cl. 126-25.00R.

Huberts, John T.: *See*—
Wiseman, Alan G.; and Huberts, John T., 4,598,596, Cl. 73-864.220.

Huck Manufacturing Company: *See*—
Mondello, Brian C.; and Rosier, Hendrik E., 4,598,572, Cl. 72-391.000.

Huensch, George D.: *See*—
Cornell, Ronald G.; Huensch, George D.; Shelhamer, Kenneth W.; and Warty, Pramod, 4,599,490, Cl. 179-2.0EB.

Huffman, William F.: *See*—
Ali, Fadia E.; and Huffman, William F., 4,599,324, Cl. 514-11.000.

Huffy Corporation: *See*—
Kleinebenne, Dieter; and Kleinebenne, Fred, 4,598,922, Cl. 280-279.000.

Hughes Aircraft Company: *See*—
Hill, William H., 4,598,853, Cl. 228-4.500.

Hughes, Larry M.: *See*—
Kelleher, Kevin C.; and Hughes, Larry M., 4,599,564, Cl. 324-251.000.

Hughes Tool Company: *See*—
Nevels, David L.; and Baugh, John L., 4,598,774, Cl. 166-382.000.

Hugo, Peter; and Noack, Rainer, to Rhein-Chemie Rheinau GmbH. Bis-[2,5-dithio-1,3,4-thiadiazole] and a process for its production. 4,599,425, Cl. 548-142.000.

Hunter, James R.: *See*—
Cajthaml, Peter, Jr.; and Hunter, James R., 4,598,859, Cl. 228-185.000.

Hurley, James E.: *See*—
Herrelko, Edward J.; Hurley, James E.; and Day, William J., 4,598,691, Cl. 126-41.00R.

Hutchinson, Albert L.: *See*—
Bethea, Clyde G.; Capasso, Federico; Hutchinson, Albert L.; Levine, Barry F.; and Tsang, Won-Tien, 4,599,632, Cl. 357-30.000.

Hutchison, Wanda S.: *See*—
Bussard, Anne B.; and Hutchison, Wanda S., 4,598,975, Cl. 350-96.240.

Hynecek, Jaroslav, to Texas Instruments Incorporated. Process protection for individual device gates on large area MIS devices. 4,599,639, Cl. 357-23.130.

IBM: *See*—
Castellano, Anthony J., Jr.; DiStefano, Thomas H.; and Olyha, Robert S., Jr., 4,599,558, Cl. 324-158.00R.

Ichikawa, Hajime, to Olympus Optical Company Limited. Anti-reflection coating for optical component and method for forming the same. 4,599,272, Cl. 428-412.000.

Ida, Masatoshi: *See*—
Kimura, Kenji; and Ida, Masatoshi, 4,599,653, Cl. 358-224.000.

Ide, Toshihiko: *See*—
Hishikari, Isao; and Ide, Toshihiko, 4,599,507, Cl. 219-486.000.

Ideta, Yasufumi, to Nissan Motor Company, Limited. Pump control arrangement for automatic automotive transmission or the like. 4,598,612, Cl. 74-867.000.

Iidaka, Yoshiaki: *See*—
Shirai, Shoji; Yamauchi, Masaaki; Iidaka, Yoshiaki; Takano, Hiroshi; and Fukushima, Masakazu, 4,599,534, Cl. 313-414.000.

Iinuma, Fjuio: *See*—
Irikura, Tsutomu; Murayama, Satoshi; and Iinuma, Fjuio, 4,599,418, Cl. 544-361.000.

Ikemoto, Kazuhito, to Toyota Jidosha Kabushiki Kaisha. Device for preventing reverse gear buzzing in a manual transmission. 4,598,599, Cl. 74-411.500.

Ikushima, Kazuo; Itoh, Yoshio; and Ishihara, Toshiaki, to NGK Insulators, Ltd. Age-hardening copper titanium alloy. 4,599,119, Cl. 148-411.000.

ILC Technology, Inc.: *See*—
Roberts, Roy D., 4,599,540, Cl. 313-570.000.

Illinois Tool Works Inc.: *See*—
Froeb, John W.; and Mondul, Donald D., 4,599,605, Cl. 340-347.00P.

Ilon, Bengt E., to Mecanum Innovation AB. Device for exploiting the maximum drive unit torque of the drives of vehicles or conveyers. 4,598,782, Cl. 180-7.100.

Imai, Atsuo: *See*—
Sugiuchi, Masami; Miyamura, Masataka; Imai, Atsuo; and Matake, Shigeru, 4,598,979, Cl. 350-357.000.

Imperial Chemical Industries PLC: *See*—
Colquhoun, Howard M.; and Breeze, Alan G., 4,599,452, Cl. 568-319.000.
Hey, David G., 4,599,187, Cl. 252-171.000.
Jones, Michael E. B., 4,599,373, Cl. 523-116.000.

Imperial Clevite Inc.: *See*—
Maldavs, Ojars, 4,598,896, Cl. 251-149.600.

Imre nee Virag, Ilona: *See*—
Salamon, Zoltan; Imre nee Virag, Ilona; and Sebestyen, Magdolna, 4,599,345, Cl. 514-311.000.

IMS-Kunststoffgesellschaft m.b.H.: *See*—
Kugler, Wolfgang; and Ostermann, Wolfgang, 4,599,012, Cl. 404-10.000.

Ingersoll-Rand Company: *See*—
Barrows, Robert E., 4,598,796, Cl. 184-42.000.

Innovative Concepts, Inc.: *See*—
Long, Jerry M.; and Womack, James A., 4,598,824, Cl. 206-444.000.

Inoue, Akira, to Olympus Optical Co., Ltd. Exposure control device for camera. 4,598,985, Cl. 354-21.000.

Inoue, Masahiro: *See*—
Hayashi, Saburo; Mukai, Mitsukazu; Inoue, Masahiro; Tsuchiya, Hiroo; Otsuji, Akira; and Tanabe, Takeo, 4,599,177, Cl. 210-718.000.

Inoue, Michihiro: *See*—
Matzuzawa, Akira; and Inoue, Michihiro, 4,599,602, Cl. 340-347.0AD.

Inoue, Takashi: *See*—
Yamamoto, Kaoru; Inoue, Takashi; Kojima, Shinji; and Nishimura, Sadahiro, 4,599,391, Cl. 526-282.000.

Inoue, Tsuneo: *See*—
Nakatani, Kiyoshi; Numata, Satoshi; Inoue, Tsuneo; Hosono, Akira; Oda, Kengo; Kubota, Yutaka; Tachibana, Hajime; Udagawa, Takatoshi; and Gohbara, Masatoshi, 4,599,362, Cl. 514-721.000.

Intel Corporation: *See*—
Senderowicz, Daniel, 4,599,573, Cl. 330-107.000.
Intermedics, Inc.: *See*—
Pless, Benjamin D.; and Stotts, Lawrence J., 4,599,523, Cl. 307-31.000.
International Business Machines Corporation: *See*—
Araps, Constance J.; Kandetzke, Steven M.; Kutner, Ellen L.; and Takacs, Mark A., 4,599,136, Cl. 156-643.000.
Babu, Suryadevara V.; Hoffarth, Joseph G.; and Welsh, John A., 4,599,134, Cl. 156-626.000.
Bellinghausen, Joan M., 4,599,656, Cl. 358-261.000.
Boland, Lawrence J., 4,598,966, Cl. 339-75.0MP.
Bolton, Ivor W., 4,599,670, Cl. 360-137.000.
Brownlow, James M.; and Rosenberg, Robert, 4,599,277, Cl. 428-552.000.
Chellis, Leroy N., 4,599,268, Cl. 428-394.000.
Dougherty, William E., Jr.; Greer, Stuart E.; and Sargent, Robert W., 4,598,470, Cl. 29-837.000.
Gabric, John A.; and O'Neil, Edward F., 4,599,520, Cl. 307-578.000.
Kunzinger, Charles A., 4,599,720, Cl. 370-104.000.
Munn, Robert D.; and Stilwell, George R., Jr., 4,598,974, Cl. 350-96.210.
Sachdev, Harbans S.; and Sachdev, Krishna G., 4,599,243, Cl. 427-38.000.
Schuster, Stanley E., 4,599,708, Cl. 365-189.000.
International Flavors & Fragrances Inc.: *See*—
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,599,468, Cl. 568-420.000.
Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,599,237, Cl. 426-535.000.
International Microporous Technology, Inc.: *See*—
Chen, William K. W., 4,598,662, Cl. 118-34.000.
International Minerals & Chemical Corp.: *See*—
Maccecchini, Maria-Luisa, 4,599,229, Cl. 424-85.000.
Srinivasan, Viswanathan; and Quicksall, Carl O., 4,599,156, Cl. 204-182.400.
International Paper Company: *See*—
Wiley, Teddy E.; and Payne, James C., 4,598,825, Cl. 206-453.000.
International Standard Electric Corporation: *See*—
Minks, Werner, 4,599,593, Cl. 335-274.000.
Rausch, Helmut, 4,599,621, Cl. 343-410.000.
International Telephone and Telegraph Corporation: *See*—
Bussard, Anne B.; and Hutchison, Wanda S., 4,598,975, Cl. 350-96.240.
Selvin, Gerald J., 4,598,959, Cl. 339-14.00R.
InterNorth, Inc.: *See*—
Dickey, Leland C., 4,599,225, Cl. 423-659.000.
Inteso, Ronald N. Embroidery frame. 4,598,488, Cl. 38-102.300.
Intra-Cofor: *See*—
Baud, Jean-Pierre, 4,598,591, Cl. 73-784.000.
Inuzuka, Tsuneki: *See*—
Tomosada, Masahiro; Maeshima, Katsuyoshi; Inuzuka, Tsuneki; and Sakamaki, Hisashi, 4,598,994, Cl. 355-14.00R.
Ioka, Yoshinori: *See*—
Tsuji, Toshihide; Ioka, Yoshinori; Anzai, Hisatugu; Kasahara, Noboru; and Katagiri, Fujio, 4,598,494, Cl. 49-2.000.
Irikura, Tsutomu; Murayama, Satoshi; and Iinuma, Fjuio, to Kyorin Seiyaku Kabushiki Kaisha. Benzoquinolizine carboxylic acid derivatives, and process for preparation thereof. 4,599,418, Cl. 544-361.000.
Isaacs, Stephen T.: *See*—
Yabusaki, Kenichi K.; Isaacs, Stephen T.; and Gamper, Howard B., Jr., 4,599,303, Cl. 435-6.000.
Iseki, Hidemi: *See*—
Yamaguchi, Akira; Shigehara, Hiroshi; and Iseki, Hidemi, 4,599,580, Cl. 331-8.000.
Iseki, Seiichi, to Super Tool Co., Ltd. Tool for connecting a pair of pipes through a coupling pipe. 4,598,452, Cl. 29-237.000.
Isenberg, Arnold O.; and Ruka, Roswell J., to Westinghouse Electric Corp. Protective interlayer for high temperature solid electrolyte electrochemical cells. 4,598,467, Cl. 29-623.500.
Isendam, Jules N.: *See*—
van Hattem, Hendricus W. M.; and Isendam, Jules N., 4,599,252, Cl. 428-35.000.
Ishibashi, Akira: *See*—
Mutoh, Nobuyoshi; Sakai, Keijiro; Ueda, Akiteru; Ishibashi, Akira; and Okajima, Ikuo, 4,599,549, Cl. 318-798.000.
Ishibashi, Yoji: *See*—
Saito, Isao; Ishibashi, Yoji; Ohmori, Takashi; Minakawa, Yoshimitsu; and Kuroda, Michio, 4,598,553, Cl. 60-733.000.
Ishida, Tetsuo: *See*—
Murakami, Shunichi; Ishida, Tetsuo; and Sakai, Junro, 4,599,069, Cl. 432-253.000.
Ishihara, Toshiaki: *See*—
Ikushima, Kazuo; Itoh, Yoshio; and Ishihara, Toshiaki, 4,599,119, Cl. 148-411.000.
Ishihara, Yoshinobu; Minami, Kazuya; and Matsumoto, Shuntaro, to Kabushiki Kaisha Kobe Seiko Sho. Vertical type continuous casting apparatus having a torch cutter. 4,598,761, Cl. 164-263.000.
Ishii, Hiroshi: *See*—
Kawamura, Yoshikazu; Hosokawa, Minoru; Okazaki, Sakiho; and Ishii, Hiroshi, 4,599,005, Cl. 368-157.000.
Ishikawa, Masataka; and Kondo, Masami, to Diesel Kiki Co., Ltd. Circuit for driving solenoid. 4,599,674, Cl. 361-154.000.
Ishimori, Tsutomu: *See*—
Yasuda, Kikuo; Takezaki, Takayuki; Ohuchi, Rikio; Ohuyabu, Hiroshi; Tanimoto, Yoshitaka; Seki, Toshimi; Yamaguchi, Takashi; Izumi, Akihiro; Himori, Norio; and Ishimori, Tsutomu, 4,599,333, Cl. 514-247.000.
Ishimoto, Souji: *See*—
Kamei, Mitsuhito; Nemoto, Shin; and Ishimoto, Souji, 4,598,998, Cl. 356-237.000.
Ishizaki, Akira: *See*—
Sakai, Shinji; Ishizaki, Akira; and Kawabata, Takashi, 4,599,603, Cl. 340-347.0AD.
Ishizaki, Naoki; and Morita, Koichi, to Kabushiki Kaisha Komatsu Seisakusho. Device for controlling displacement of variable displacement hydraulic pump. 4,599,050, Cl. 417-216.000.
Ishizuka, Akio; Yamazaki, Hisashi; and Yamazaki, Kikuo, to Fuji Photo Film Co., Ltd. Radiation image storage panel. 4,599,539, Cl. 313-525.000.
Itagaki, Takafumi, to Tamatoshi Industries Ltd. Wall display structure. 4,598,504, Cl. 52-36.000.
Itami, Teruhiko: *See*—
Saitoh, Koichi; Itami, Teruhiko; Kimoto, Toshifumi; and Nishimura, Nobuo, 4,599,658, Cl. 360-59.000.
Ito, Eiji: *See*—
Yamada, Minoru; Ito, Eiji; and Nagai, Masaru, 4,598,989, Cl. 354-400.000.
Ito, Hidefumi: *See*—
Yoshida, Isao; Okabe, Takeaki; Ochi, Shikayuki; Ito, Hidefumi; Furumi, Masatomo; Takeuchi, Masaru; and Nagata, Minoru, 4,599,576, Cl. 330-264.000.
Ito, Novuei; Atsumi, Kinya; Mizuno, Naohito; and Kikuchi, Tetsuro, to Nippon Soken, Inc. Glow plug for an internal combustion engine. 4,598,676, Cl. 123-145.00A.
Ito, Susumu, to Kabushiki Kaisha Toshiba. Induction heating apparatus with protection against power interruption. 4,599,504, Cl. 219-10.770.
Ito, Toshimitsu: *See*—
Kobayashi, Nobuyuki; and Ito, Toshimitsu, 4,598,678, Cl. 123-306.000.
Ito, Yoshiyuki: *See*—
Nakamura, Akira; Asao, Shunji; and Ito, Yoshiyuki, 4,598,730, Cl. 137-117.000.
Itoh, Kazuo; Ogiue, Katsumi; and Hayasaka, Akio, to Hitachi, Ltd. Semiconductor integrated circuit device and method of producing same. 4,599,635, Cl. 357-44.000.
Itoh, Yoshio: *See*—
Ikushima, Kazuo; Itoh, Yoshio; and Ishihara, Toshiaki, 4,599,119, Cl. 148-411.000.
Itou, Kazuo: *See*—
Naito, Mitikatu; Yano, Kiyotosi; Itou, Kazuo; Tsuzuki, Kunihiro; Tanaka, Masaaki; and Kawagoe, Michio, 4,598,729, Cl. 137-116.500.
ITT Corporation: *See*—
Denenberg, Jeffrey N., 4,599,693, Cl. 364-513.000.
Reed, Joseph, 4,599,743, Cl. 455-207.000.
Tan, Chuan-Chieh; Slack, Thomas B.; and Denenberg, Jeffrey N., 4,599,692, Cl. 364-513.000.
ITT Industries, Inc.: *See*—
Belart, Juan, 4,598,625, Cl. 91-369.00R.
Belart, Juan; and Burgdorf, Jochen, 4,598,955, Cl. 303-114.000.
Egner-Walter, Bruno; and Schmid, Eckhardt, 4,598,438, Cl. 15-250.320.
Marianu, Vlad, 4,598,800, Cl. 188-71.900.
Wagner, Wilfried, 4,598,548, Cl. 60-547.100.
Wagner, Wilfried, 4,598,624, Cl. 91-369.00R.
Iwanaga, Shin-ichiro: *See*—
Sato, Hozumi; Iwanaga, Shin-ichiro; Enyo, Hiroji; Takemura, Yasuhiko; and Kawamura, Yoshiaki, 4,599,382, Cl. 525-139.000.
Iwasaki, Hikoji: *See*—
Shimoya, Shigeo; and Iwasaki, Hikoji, 4,599,498, Cl. 200-16.00B.
Iwasaki, Tadahisa, to Pioneer Ansafone Manufacturing. Mechanism for driving a tape recorder. 4,599,662, Cl. 360-96.400.
Iwasaki, Yoshitaka; Mori, Kunio; and Tanabe, Yoshio, to Teraoka Seiko Co., Ltd. Electronic scale printer. 4,598,780, Cl. 177-3.000.
Iwatsu Electric Co., Ltd.: *See*—
Kato, Takefumi, 4,599,541, Cl. 315-8.510.
Matsuno, Keishi, 4,599,571, Cl. 330-11.000.
Izumi, Akihiro: *See*—
Yasuda, Kikuo; Takezaki, Takayuki; Ohuchi, Rikio; Ohuyabu, Hiroshi; Tanimoto, Yoshitaka; Seki, Toshimi; Yamaguchi, Takashi; Izumi, Akihiro; Himori, Norio; and Ishimori, Tsutomu, 4,599,333, Cl. 514-247.000.
Izumi, Toshiaki; Noguchi, Kiyoshi; and Kohmoto, Misao, to TDK Corporation. Magnetic recording medium. 4,599,280, Cl. 428-694.000.
Izumi, Toshiaki: *See*—
Nakayama, Masatoshi; Morita, Haruyuki; Tokuoka, Yasumichi; Izumi, Toshiaki; Fukuda, Kazumasa; and Kubota, Yuichi, 4,599,266, Cl. 428-336.000.
Izumisawa, Yoshiaki: *See*—
Tamaru, Akio; Izumisawa, Yoshiaki; Hashimoto, Hidekichi; Kuma, Kiyoji; Komaya, Takashi; and Minagawa, Masanobu, 4,599,465, Cl. 568-781.000.
J & G Importing Inc.: *See*—
Cuttica, Angelo, 4,599,254, Cl. 428-45.000.
J. M. Voith GmbH: *See*—
Schiel, Christian; and Zurn, Georg, 4,598,448, Cl. 29-116.0AD.

JACA Corporation: *See—*
McMaster, Robert C., 4,598,592, Cl. 73-786.000.

Jaccod, Michel: *See—*
Mongin, Michel; and Jaccod, Michel, 4,598,677, Cl. 123-195.00A.

Jackson, Jacqueline J.: *See—*
Cooper, Daniel; and Jackson, Jacqueline J., 4,599,219, Cl. 422-61.000.

Jacobson, Irwin S., to United States of America, Navy. Electronic feedback area control system for TVC gas generator. 4,599,044, Cl. 417-42.000.

James, Robert G., to Armco Inc. Control improvements in deep well pumps. 4,599,046, Cl. 417-44.000.

Jankowski, Cecelia: *See—*
Vojir, William M.; and Jankowski, Cecelia, 4,599,701, Cl. 364-752.000.

Janome Sewing Machine Co. Ltd.: *See—*
Makabe, Hachiro; Koide, Akio; Tachibana, Chijyo; and Yamamoto, Kazuji, 4,598,657, Cl. 112-275.000.

Janome Sewing Machine Co. Ltd: *See—*
Takenoya, Hideaki, 4,598,655, Cl. 112-103.000.

Janssen, Wilhelm; and Ulrich, Klaus, to Fried. Krupp Gesellschaft mit berschrankter Haftung. Apparatus for preheating granular ore. 4,599,068, Cl. 432-97.000.

Janssen, Wilhelmus H. J.: *See—*
Kohaut, Gunter; Weber, Werner; Groenendijk, Herman; Poppelaars, Adrianus C.; and Janssen, Wilhelmus H. J., 4,599,269, Cl. 428-397.000.

Japan Synthetic Rubber Co., Ltd.: *See—*
Sato, Hozumi; Iwanaga, Shin-ichiro; Enyo, Hiroji; Takemura, Yasuhiko; and Kawamura, Yoshiaki, 4,599,382, Cl. 525-139.000.

Jarinko, Philip A.; Schuitemaker, Frans; and Bishop, Paul W., to Union Carbide Corporation. High crop overhead sprayer frame. 4,598,864, Cl. 239-152.000.

Jaycox, Jeffrey M.; and Pitzer, Dorman C., to Texet Corportion. Vertical MOSFET with current monitor utilizing common drain current mirror. 4,599,554, Cl. 323-317.000.

Jayne, Michael E.; and Gray, Robert B., to R P & M Engines. Apparatus for stabilizing the position of a yoke in an internal combustion engine. 4,598,672, Cl. 123-56.0BC.

Jeffers, John: *See—*
George, Ashok K.; and Jeffers, John, 4,599,647, Cl. 358-122.000.

Jenkins, Cecil: *See—*
Woolslayer, Homer J.; Jenkins, Cecil; and Vogt, Dewayne G., 4,598,509, Cl. 52-118.000.

Jennett, James A. Method of molding rubber articles and rubber molding machine. 4,599,210, Cl. 264-40.500.

Jenssen, Hans P., to Massachusetts Institute of Technology. Strontium aluminum fluoride laser. 4,599,727, Cl. 372-41.000.

Jewett, David N.; Bates, Herbert E.; and Milstein, Joseph B., to Energy Materials Corporation. Guidance system for low angle silicon ribbon growth. 4,599,132, Cl. 156-617.00H.

Joe, Chun-Chuan; and Joe, Fa-Chang. Slip-resistant disposable shoe cover. 4,598,485, Cl. 36-7.200.

Joe, Fa-Chang: *See—*
Joe, Chun-Chuan; and Joe, Fa-Chang, 4,598,485, Cl. 36-7.200.

Johannes, Haftmann, to Nixdorf Computer AG. Fastening system for fastening a device which has two spaced holding flanges. 4,598,894, Cl. 248-615.000.

Johnson, Alfred N.: *See—*
Prisco, Anthony J.; and Johnson, Alfred N., 4,599,513, Cl. 250-336.100.

Johnson, David C.; and Allen, James S., to D. C. Johnson & Associates, Inc. Barrier vapor control system. 4,598,741, Cl. 141-5.000.

Johnson, Everett A.: *See—*
Silverman, Daniel; and Johnson, Everett A., 4,599,509, Cl. 235-382.000.

Johnson, Johnny, III. Air-driven ceiling fan. 4,598,632, Cl. 98-40.050.

Johnson, Marvin M.: *See—*
Cymbaluk, Ted H.; Byers, Jim D.; and Johnson, Marvin M., 4,599,469, Cl. 570-193.000.

Johnson, Robert B.: *See—*
Milligan, Timothy H.; and Johnson, Robert B., 4,598,526, Cl. 53-251.000.

Jones, Anthony C.: *See—*
Mullin, John B.; Holliday, Arthur K.; Cole-Hamilton, David J.; Jones, Anthony C.; and Gerrard, Neil D., 4,599,150, Cl. 204-59.0QM.

Jones, Claude R.: *See—*
Ware, Kenneth D.; and Jones, Claude R., 4,599,731, Cl. 372-77.000.

Jones, John F.: *See—*
Williams, Sam B.; Jones, John F.; and Dorer, David K., 4,598,544, Cl. 60-226.100.

Jones, Michael E. B., to Imperial Chemical Industries PLC. Aromatic oligomers and resins. 4,599,373, Cl. 523-116.000.

Jones, Stanley P., to Emhart Industries, Inc. Cyclic process of forming glassware in an individual section glassware forming machine. 4,599,099, Cl. 65-29.000.

Jones, Stephen H.: *See—*
Hollingsworth, Alexander; and Jones, Stephen H., 4,598,527, Cl. 53-427.000.

Jordan, Heinz, to Technische Gerate-u,Entwicklungsgesellschaft m.b.H. Rotary wing flying craft. 4,598,887, Cl. 244-17.110.

Jos. Dyson & Sons, Inc.: *See—*
Wolf, Theodore L., 4,599,038, Cl. 414-785.000.

Jowitt, Raymond; and Abell, Ian D., to British Steel Corporation. Analysis of materials. 4,598,577, Cl. 73-23.000.

Joyce, Christopher: *See—*
White, Cyril J.; and Joyce, Christopher, 4,598,963, Cl. 339-17.00C

Juang, Ruey T. Adjustable beach-shoes. 4,599,071, Cl. 441-64.000.

Junemann, Werner: *See—*
Dehnert, Johannes; and Junemann, Werner, 4,599,402, Cl. 534-700.000.

Jung, Gerard: *See—*
Mugnier, Jacques; Jung, Gerard; and Prioul, Jean-Louis, 4,599,312, Cl. 435-172.300.

Kabushiki Kaisha Kanesaka Gijutsu Kenkyusho: *See—*
Kanesaka, Hiroshi, 4,598,863, Cl. 239-96.000.

Kabushiki Kaisha Kobe Seiko Sho: *See—*
Ishihara, Yoshinobu; Minami, Kazuya; and Matsumoto, Shuntaro, 4,598,761, Cl. 164-263.000.
Kawai, Nobuyasu; Hirano, Minoru; Manto, Hiromune; Esaka, Hajime; and Fujimoto, Hirofumi, 4,599,109, Cl. 75-238.000.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Fuchigami, Masao; and Matsuo, Yuichi, 4,598,756, Cl. 164-37.000.
Ishizaki, Naoki; and Morita, Koichi, 4,599,050, Cl. 417-216.000.

Kabushiki Kaisha Morita Seisakusho: *See—*
Nishikawa, Kazuo; and Mori, Keisuke, 4,599,739, Cl. 378-39.000.

Kabushiki Kaisha Murakoshi Seiko: *See—*
Tashiro, Hidenori; and Watanabe, Minoru, 4,599,011, Cl. 403-407.100.

Kabushiki Kaisha Sanwa Jidoki Seisakusho: *See—*
Takagaki, Ichiro, 4,598,533, Cl. 53-552.000.

Kabushiki Kaisha Toshiba: *See—*
Ito, Susumu, 4,599,504, Cl. 219-10.770.
Shimbo, Takao, 4,599,716, Cl. 369-36.000.
Suzuki, Nobukazu; and Tsuruta, Shinji, 4,599,157, Cl. 204-192.0SP.
Suzuki, Shuichi; Wada, Moriyasu; and Hayase, Shuzi, 4,599,155, Cl. 522-8.000.
Yamaguchi, Akira; Shigehara, Hiroshi; and Iseki, Hidemi, 4,599,580, Cl. 331-8.000.

Kabushiki Kaisha Yamashina Seikosho: *See—*
Sano, Nariaki; and Amano, Tetsuo, 4,599,024, Cl. 411-387.000.

Kadooka, Katsuyuki: *See—*
Saitoh, Hiroshi; Kadooka, Katsuyuki; Tsukamoto, Mamoru; Ono, Shoji; and Ohkawa, Masaki, 4,599,238, Cl. 426-557.000.

Kaehler, Marian: *See—*
Hamer, Dean H.; Kaehler, Marian; and Leder, Philip, 4,599,308, Cl. 435-68.000.

Kahlcke, Hartwig: *See—*
Schiebelhuth, Heinz; Franke, Wolfgang; Kahlcke, Hartwig; and Oppermann, Gunter, 4,599,003, Cl. 366-241.000.

Kairisalo, Pekka J.: *See—*
Marvola, Martti L. A.; Marttila, Esko V.; Uotila, Jaakko A.; Pippuri, Aino K.; Kairisalo, Pekka J.; and Honkanen, Erkki J., 4,599,326, Cl. 514-29.000.

Kaji, Hiroyuki; and Nitta, Yoshihiko, to Hitachi, Ltd. Displaying and correcting method for machine translation system. 4,599,612, Cl. 340-723.000.

Kaji, Toshio: *See—*
Kinoshita, Takao; Tojo, Akihiko; Takayama, Tsutomu; Kaji, Toshio; and Tanaka, Nobuyoshi, 4,599,657, Cl. 358-335.000.

Kajimura, Takashi: *See—*
Sasaki, Yoshimitsu; Kajimura, Takashi; Chinone, Naoki; and Nakamura, Michiharu, 4,599,729, Cl. 372-49.000.

Kajiwara, Akiharu: *See—*
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Nakamoto, Kouji; Kajiwara, Akiharu; Katayama, Kouichi; Tsunoda, Hajime; Murakami, Manabu; Ono, Hideki; and Yamada, Kouji, 4,599,328, Cl. 514-106.000.

Kaloff, Hans: *See—*
Schulte, Bernhard; Tischer, Werner; Kaloff, Hans; and Weber, Hans-Leo, 4,599,262, Cl. 428-215.000.

Kamanaka, Yoshiyuki: *See—*
Kubo, Haruaki; and Kamanaka, Yoshiyuki, 4,598,617, Cl. 82-36.00R.

Kambara, Jun; Ohmuro, Yuzo; and Kamogawa, Nin-ichi, to Konishiroku Photo Industry Co., Ltd. Method and device of developing an electrostatic latent image. 4,599,292, Cl. 430-122.000.

Kamei, Mitsuhito; Nemoto, Shin; and Ishimoto, Souji, to Sumitomo Kinzoku Kogyo Kabushiki Kaisha; and Mitsubishi Denki Kabushiki Kaisha. Screw surface flaw inspection method and an apparatus therefor. 4,598,998, Cl. 356-237.000.

Kaminski, Joan M.: *See—*
Horodysky, Andrew G.; Kaminski, Joan M.; Ashjian, Henry; and Gawel, Henry A., 4,599,183, Cl. 252-32.70E.

Kamisaka, Makoto; Okamoto, Toshiro; Ohshima, Michio; and Tamai, Mamoru, to Mitsubishi Jukogyo Kabushiki Kaisha. Thermal cracking method for producing olefines from hydrocarbons. 4,599,478, Cl. 585-648.000.

Kamiya, Takashi; Tanaka, Kunihiko; Teraji, Tsutomu; and Nakai, Yoshiharu, to Fujisawa Pharmaceutical Co. Amino thiazole compounds. 4,599,426, Cl. 548-195.000.

Kamogawa, Nin-ichi: *See—*
Kambara, Jun; Ohmuro, Yuzo; and Kamogawa, Nin-ichi, 4,599,292, Cl. 430-122.000.

Kanai, Yasunori; Sugiyama, Eiji; and Nawata, Kazumasa, to Fujitsu Limited. Bias circuitt with voltage and temperature compensation for an emitter coupled logic circuit. 4,599,521, Cl. 307-455.000.

Kanawyer, Donald S. Turbocharger manifold pressure control system. 4,598,549, Cl. 60-611.000.

Kandetzke, Steven M.: *See*—
Araps, Constance J.; Kandetzke, Steven M.; Kutner, Ellen L.; and Takacs, Mark A., 4,599,136, Cl. 156-643.000.
Kaneko, Takeru; Ozaki, Satoru; Takizawa, Kimie; and Sugimoto, Hachiro, to Eisai Co., Ltd. Antiphlogistic/antipyretic/analgesic agents containing theobromine or theophylline derivatives as active ingredient. 4,599,337, Cl. 514-265.000.
Kanemitsu, Shinji: *See*—
Mizutani, Morikazu; Onoda, Shigeyoshi; Nomura, Akihiro; Kanemitsu, Shinji; and Toriumi, Mototada, 4,598,993, Cl. 355-3.00R.
Kanesaka, Hiroshi, to Usui Kokusai Sangyo Kabushiki Kaisha; and Kabushiki Kaisha Kanesaka Gijutsu Kenkyusho. Fuel injector. 4,598,863, Cl. 239-96.000.
Kanner, Bernard; and Lewis, Kenrick M., to Union Carbide Corporation. Process for preparing organohalosilanes utilizing copper halide-aluminum halide catalysts. 4,599,441, Cl. 556-469.000.
Kanno, Michio; and Nogawa, Atsuhiko, to Terumo Corporation. Apparatus for detecting the volume of blood in a blood reservoir. 4,598,733, Cl. 137-406.000.
Kanno, Tatsuya: *See*—
Toga, Yuzo; Okamoto, Ichiro; and Kanno, Tatsuya, 4,599,460, Cl. 568-617.000.
Kao, David T., to University of KY Research Foundation. Double acting self-flushing pump. 4,598,630, Cl. 92-78.000.
Kaplan, Isaac R.: *See*—
Demaison, Gerard J.; and Kaplan, Isaac R., 4,599,218, Cl. 422-61.000.
Karis, Arthur T.: *See*—
Frye, Kenneth G.; and Karis, Arthur T., 4,598,849, Cl. 226-21.000.
Kasahara, Noboru: *See*—
Tsuji, Toshihide; Ioka, Yoshinori; Anzai, Hisatugu; Kasahara, Noboru; and Katagiri, Fujio, 4,598,494, Cl. 49-2.000.
Kasai, Atsushi: *See*—
Yoshimura, Tamotsu; Nakamura, Masahiko; and Kasai, Atsushi, 4,599,397, Cl. 528-190.000.
Katagiri, Fujio: *See*—
Tsuji, Toshihide; Ioka, Yoshinori; Anzai, Hisatugu; Kasahara, Noboru; and Katagiri, Fujio, 4,598,494, Cl. 49-2.000.
Katayama, Kouichi: *See*—
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Nakamoto, Kouji; Kajiwara, Akiharu; Katayama, Kouichi; Tsunoda, Hajime; Murakami, Manabu; Ono, Hideki; and Yamada, Kouji, 4,599,328, Cl. 514-106.000.
Kato, Katsushi; and Mizuno, Toshiaki, to Nippondenso Co., Ltd. Apparatus for controlling air/fuel ratio for internal combustion engine. 4,598,684, Cl. 123-478.000.
Kato, Takefumi, to Iwatsu Electric Co., Ltd. Scan converter storage tube with a multiple collector storage target, and method of operation. 4,599,541, Cl. 315-8.510.
Katsuhara, Yutaka: *See*—
Maruyama, Yutaka; Negishi, Junji; Murata, Katuyoshi; and Katsuhara, Yutaka, 4,599,455, Cl. 568-411.000.
Katsumata, Tsutomu: *See*—
Kawakami, Kiyoshi; Ohashi, Hiroyuki; and Katsumata, Tsutomu, 4,599,145, Cl. 203-71.000.
Katz, Egon: *See*—
Scholz, Hans-Jurgen; Brambilla, Luigi; Katz, Egon; Bossenmaier, Alban; and Zweigart, Gerhard, 4,598,943, Cl. 296-97.00H.
Kauffman, William J.; Colyer, Timothy D.; and Dees, Martin, Jr., to Armstrong World Industries, Inc. Decorative laminate. 4,599,264, Cl. 428-264.000.
Kaufman, Richard A.: *See*—
Hahn, Benjamin A.; Kaufman, Richard A.; and Wesolowski, Alexander F., 4,599,316, Cl. 436-105.000.
Kautt & Bux KG: *See*—
Gerlach, Karl-Heinz; and Worner, Lothar, 4,598,463, Cl. 29-597.000.
Kavesh, Sheldon: *See*—
Kwon, Young D.; Kavesh, Sheldon; and Prevorsek, Dusan C., 4,599,267, Cl. 428-364.000.
Kawabata, Takashi: *See*—
Sakai, Shinji; Ishizaki, Akira; and Kawabata, Takashi, 4,599,603, Cl. 340-347.0AD.
Kawagoe, Michio: *See*—
Naito, Mitikatu; Yano, Kiyotosi; Itou, Kazuo; Tsuzuki, Kunihiro; Tanaka, Masaaki; and Kawagoe, Michio, 4,598,729, Cl. 137-116.500.
Kawai, Nobuyasu; Hirano, Minoru; Manto, Hiromune; Esaka, Hajime; and Fujimoto, Hirofumi, to Kabushiki Kaisha Kobe Seiko Sho. High hardness and high toughness nitriding powder metallurgical high-speed steel. 4,599,109, Cl. 75-238.000.
Kawakami, Fumiaki: *See*—
Yamamizu, Takafumi; and Kawakami, Fumiaki, 4,599,175, Cl. 210-635.000.
Kawakami, Kiyoshi; Ohashi, Hiroyuki; and Katsumata, Tsutomu, to Asahi Kasei Kogyo Kabushiki Kaisha. Recovery process for producing purified methacrylonitrile. 4,599,145, Cl. 203-71.000.
Kawamura, Yoshiaki: *See*—
Sato, Hozumi; Iwanaga, Shin-ichiro; Enyo, Hiroji; Takemura, Yasuhiko; and Kawamura, Yoshiaki, 4,599,382, Cl. 525-139.000.
Kawamura, Yoshikazu; Hosokawa, Minoru; Okazaki, Sakiho; and Ishii, Hiroshi, to Seiko Epson Corporation. Step motor control mechanism for electronic timepiece. 4,599,005, Cl. 368-157.000.
Kawarabashi, Tsukasa: *See*—
Uchida, Hiroshi; and Kawarabashi, Tsukasa, 4,598,869, Cl. 242-35.50A.
Kawasaki, Glenn H. Glycolytic promoters for regulated protein expresion: protease inhibitor. 4,599,311, Cl. 435-71.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Matsui, Shigetomo, 4,598,857, Cl. 228-132.000.
Kawazoe, Mitsuo: *See*—
Shiratori, Kazutoshi; Kodama, Takashi; Kawazoe, Mitsuo; Miyasaka, Tetsuo; and Nagao, Masaki, 4,598,986, Cl. 354-21.000.
Kean, Walter F.: *See*—
Harvey, Debra A.; Kean, Walter F.; and Lock, Colin J. L., 4,599,436, Cl. 556-114.000.
Keen, Frederick I.: *See*—
Choy, Clement K.; and Keen, Frederick I., 4,599,186, Cl. 252-102.000.
Keifer, Terry A. Versatile garment security device. 4,598,827, Cl. 211-4.000.
Keigler, John E.; and Hartshorne, Frank A., to RCA Corporation. Satellite dual antenna pointing system. 4,599,619, Cl. 343-352.000.
Keith, Daniel. Continuous mixing tank for liquid spray chemicals. 4,599,004, Cl. 366-241.000.
Kelleher, Kevin C.; and Hughes, Larry M., to RCA Corporation. Tubular semiconductor magnetic field sensor and circuits for use therewith. 4,599,564, Cl. 324-251.000.
Kelly, Peter B.; and Heagle, Edward R., to General Electric Company. High impact resistant laminate surface for a bowling lane. 4,599,124, Cl. 156-71.000.
Kemeny, George A.; and Fox, Russell E., to Westinghouse Electric Corp. Current limiting devices utilizing resistive parallel rails. 4,599,671, Cl. 361-58.000.
Kendall Company, The: *See*—
McAllester, Spears L., 4,598,458, Cl. 128-132.00D.
Kendrick, Marjorie A.; and Kendrick, William M. Sporting cribbage game. 4,598,912, Cl. 273-245.000.
Kendrick, William M.: *See*—
Kendrick, Marjorie A.; and Kendrick, William M., 4,598,912, Cl. 273-245.000.
Kennecott Corporation: *See*—
Cooper, Paul V., 4,598,899, Cl. 266-212.000.
Long, William D., 4,598,675, Cl. 123-90.510.
Kennedy, Donald L.; Kennedy, John P.; and Kennedy, Peggy, executrix. Vehicle lift. 4,599,034, Cl. 414-678.000.
Kennedy, John P.: *See*—
Kennedy, Donald L.; Kennedy, John P.; and Kennedy, Peggy, executrix, 4,599,034, Cl. 414-678.000.
Kennedy, Joseph P.: *See*—
Farona, Michael F.; and Kennedy, Joseph P., 4,599,384, Cl. 525-245.000.
Kennedy, Peggy, executrix: *See*—
Kennedy, Donald L.; Kennedy, John P.; and Kennedy, Peggy, executrix, 4,599,034, Cl. 414-678.000.
Kerber, Robert: *See*—
Franke, Eric; Kerber, Robert; and Langley, Marion D., 4,598,854, Cl. 228-48.000.
Kerbow, Dewey L.: *See*—
Carlson, Dana P.; Kerbow, Dewey L.; Leck, Thomas J.; and Olson, Allan H., 4,599,386, Cl. 525-326.200.
Kerdoncuff, Guy P.; and Provendier, Jacques H., to Societe Anonyme de Telecommunications. Process and device for digital frequency generation. 4,599,700, Cl. 364-721.000.
Kerr Glass Manufacturing Corporation: *See*—
Herr, James E., 4,598,833, Cl. 215-220.000.
Kersten, Hilde; and Meyer, Gerhard, to AKZO NV. Production of vicinal alkylene glycols. 4,599,467, Cl. 568-867.000.
Kerwin, Daniel. Machine and method for applying miniaturized indicia to articles. 4,599,129, Cl. 156-361.000.
Kesling, Haven S., Jr.; and Harris, James J., to Atlantic Richfield Company. Anti-static styrene polymer particles. 4,599,366, Cl. 521-57.000.
Ketzinel, Zvi; Volkman, Ygal; and Hassid, Moshe, to State of Israel, Atomic Energy Commission, Nuclear Research Center Negev, The. Recovery of uranium from wet process phosphoric acid by liquid-solid ion exchange. 4,599,221, Cl. 423-7.000.
Khare, Ashok; and Duliba, Paul, to National Forge Company. Induction hardening of steel. 4,599,502, Cl. 219-8.500.
Khorsand, Hossein. Reciprocating drive mechanism. 4,599,007, Cl. 400-322.000.
Kiehs, Karl: *See*—
Lange, Arno; Kiehs, Karl; and Adolphi, Heinrich, 4,599,356, Cl. 514-535.000.
Kikuchi, Katsuya; and Honda, Michitaka, to Tokyo Shibaura Denki Kabushiki Kaisha. X-ray diagnostic apparatus. 4,599,742, Cl. 378-099.000.
Kikuchi, Tetsuro: *See*—
Ito, Novuei; Atsumi, Kinya; Mizuno, Naohito; and Kikuchi, Tetsuro, 4,598,676, Cl. 123-145.00A.
Kikumoto, Ryoji; Fukami, Harukazu; Hara, Hiroto; Ninomiya, Kunihiro; and Sugano, Mamoru, to Mitsubishi Chemical Industries, Inc. Pharmaceutically active (3-cyclic aminopropoxy)bibenzyls as inhibitors of platelet aggregation. 4,599,419, Cl. 544-391.000.
Killeen, Kevin P.: *See*—
Eden, James G.; and Killeen, Kevin P., 4,599,730, Cl. 372-57.000.
Kim, Young I. Automatic stepless transmission equipment. 4,598,610, Cl. 74-682.000.
Kimberly-Clark Corporation: *See*—
McFarland, Timothy M.; and Garavaglia, Arthur E., 4,598,528, Cl. 53-430.000.

Kimmel, Albert L.; Chappelow, Cecil C., Jr.; and Castelli, Vincent J., to Midwest Research Institute. Marine anti-fouling coating formulations containing a soluble phase including a organotin polymer in combination with an insoluble phase including a crosslinked organotin polymer. 4,599,368, Cl. 523-122.000.

Kimoto, Toshifumi: *See*—
Saitoh, Koichi; Itami, Teruhiko; Kimoto, Toshifumi; and Nishimura, Nobuo, 4,599,658, Cl. 360-59.000.

Kimura, Kenji; and Ida, Masatoshi, to Olympus Optical Co. Ltd. Focus indicator apparatus for an electronic camera. 4,599,653, Cl. 358-224.000.

Kimura, Shizuko, legal representative: *See*—
Tsuge, Takeyoshi; Torisawa, Yoshihiro; Makino, Ayumu; and Kimura, Tsutomu, deceased, 4,599,629, Cl. 346-140.00R.

Kimura, Takeshi; Obayashi, Hidehito; and Mochiji, Kozo, to Hitachi, Ltd. X-ray mask with Ni pattern. 4,599,737, Cl. 378-35.000.

Kimura, Tsutomu, deceased: *See*—
Tsuge, Takeyoshi; Torisawa, Yoshihiro; Makino, Ayumu; and Kimura, Tsutomu, deceased, 4,599,629, Cl. 346-140.00R.

King, Francis D.: *See*—
Hadley, Michael S.; and King, Francis D., 4,599,420, Cl. 546-124.000.

King Instrument Corporation: *See*—
Woodley, George M., 4,599,130, Cl. 156-497.000.

King, Peter F.; Farina, Samuel T.; and Korinek, Karl A., to Parker Chemical Company. Alkaline cleaning process. 4,599,116, Cl. 134-2.000.

King Radio Corporations: *See*—
Stolpman, James L., 4,599,617, Cl. 343-7.300.

King, Robin C. M.; Esterson, Maurice; and Clarke, John, to English Electric Valve Company Limited; and United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Linear beam tubes. 4,599,542, Cl. 315-59.000.

Kinoshita, Takao; Tojo, Akihiko; Takayama, Tsutomu; Kaji, Toshio; and Tanaka, Nobuyoshi, to Canon Kabushiki Kaisha. Image pick-up device. 4,599,657, Cl. 358-335.000.

Kipp, Heinrich, to Heinrich Kipp Werk. Hand lever turning mechanism. 4,598,614, Cl. 81-58.300.

Kirchweger, Karl, to A V L Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof. Dr. Dr. h.c. Hans List. Motor vehicle with a sound-absorbing capsule for the driving engine. 4,598,786, Cl. 180-68.100.

Kishikawa, Toshiro: *See*—
Doi, Yoshikazu; Miyano, Hitoshi; Kishikawa, Toshiro; and Sunaga, Yasumasa, 4,598,980, Cl. 350-445.000.

Kiss, Pal: *See*—
Gonczi, Csaba; Korbonits, Dezso ; Palosi, Endre; Kiss, Pal; Heja, Gergely; Kun, Judit; Szomor nee Wumdele, Maria; Szvoboda nee Kanzel, Ida; Marvanyos, Ede; Horvath, Karoly; Kovacs nee Mindler, Vera; and Nagy nee Koranyi, Livia, 4,599,428, Cl. 548-306.000.

Kissling, Bruno: *See*—
Heller, Jurg; Kissling, Bruno; Robinson, Tibor; and Valenti, Salvatore, 4,599,087, Cl. 8-495.000.

Kitahata, Hiroki: *See*—
Mori, Hiromitsu; Akagi, Kosuke; and Kitahata, Hiroki, 4,598,541, Cl. 60-39.070.

Kitano, Kissho: *See*—
Duvdevani, Ilan; Schulz, Donald N.; Kitano, Kissho; and Peiffer, Dennis G., 4,599,377, Cl. 524-516.000.

Kiwak, Robert S.; and Liu, Tung, to Allied Corporation. Method of constructing a brake pedal. 4,598,457, Cl. 29-411.000.

Kiyohara, Takehiko: *See*—
Terasawa, Koji; Miyakawa, Akira; and Kiyohara, Takehiko, 4,599,625, Cl. 346-140.00R.

Kiyoura, Tadamitsu, to Mitsui Toatsu Chemicals, Incorporated. Process for the preparation of 2-keto-L-gulonic acid. 4,599,446, Cl. 562-527.000.

Klausecker, Karl: *See*—
Muller, Manfred; and Klausecker, Karl, 4,599,686, Cl. 363-41.000.

Klein, Schanzlin & Becker Aktiengesellschaft: *See*—
Blank, Wilhelm; Roth, Ernst; and Tellbach, Reinhard, 4,599,487, Cl. 174-151.000.

Kleinberg, Larry K.; and Evans, Donald S., to Urban Engineering Company, Inc. Surgical instrument and method of making same. 4,598,710, Cl. 128-318.000.

Kleinebenne, Dieter; and Kleinebenne, Fred, to Huffy Corporation. Bicycle frame. 4,598,922, Cl. 280-279.000.

Kleinebenne, Fred: *See*—
Kleinebenne, Dieter; and Kleinebenne, Fred, 4,598,922, Cl. 280-279.000.

Klink, Gerhard; Kraske, Dietmar; Edinger, Egon; Koetter, Joachim; Krumrey, Klaus; Mayser, Jorg; and Michael, Ulrich, to Siemens Aktiengesellschaft. Installation for manual assemblying of components on a printed circuit board. 4,598,459, Cl. 29-564.800.

Klockner-Werke Aktiengesellschaft: *See*—
Gutjahr, Lothar, 4,599,063, Cl. 425-150.000.

Klompmaker, Berend: *See*—
Nyland, Lloyd A.; and Klompmaker, Berend, 4,598,758, Cl. 164-154.000.

Kloster, Kenneth D. Retaining nut for MacPherson strut suspension assembly. 4,599,021, Cl. 408-221.000.

Kluger, Ronald; and Mamelak, Mortimer, to University of Toronto - Innovations Foundation. Treatment of sleep disorders. 4,599,355, Cl. 514-533.000.

Knapp, Richard N., to Virginia International Terminals, Inc. Method and apparatus for moving cargo between a ship and a dock. 4,599,027, Cl. 414-139.000.

Kneen, Geoffrey: *See*—
Dickens, Jonathan P.; Donald, David K.; Kneen, Geoffrey; and McKay, William R., 4,599,361, Cl. 514-575.000.

Knoll, Jozsef: *See*—
Nogradi, Mihaly; Korbonits, Dezso ; Gottsegen, Agnes; Antus, Sandor; Furst, Zsuzsa; Knoll, Jozsef; Szejtli, Jozsef; Stadler, Agnes; Kovacs, Gabor; and Marmarosi, Katalin, 4,599,327, Cl. 514-58.000.

Knowles, William C., to United Technologies Corporation. Bearing support structure. 4,598,600, Cl. 74-423.000.

Kobayashi, Hiroshi, to Minolta Camera Kabushiki Kaisha. Bi-level phase grating focusing plate. 4,598,977, Cl. 350-162.200.

Kobayashi, Masatsune: *See*—
Yokoyama, Yasumasa; Komori, Tomoko; Eida, Tsuyoshi; Koike, Shoji; and Kobayashi, Masatsune, 4,599,112, Cl. 106-22.000.

Kobayashi, Naotake; Abe, Tetsuya; Shinohara, Satoru; and Fujiwara, Yoshio, to Sony Corporation. Cover film for sublimation transfer type hard copy. 4,599,259, Cl. 428-204.000.

Kobayashi, Nobuyuki; and Ito, Toshimitsu, to Toyota Jidosha Kabushiki Kaisha. Intake system of an internal combustion engine. 4,598,678, Cl. 123-306.000.

Kobishi Electric Co., Ltd.: *See*—
Shimoya, Shigeo; and Iwasaki, Hikoji, 4,599,498, Cl. 200-16.00B.

Koch, Frank, to DeFelsko Corporation. Method and apparatus for magnetically measuring a coating with a plurality of magnets. 4,599,562, Cl. 324-230.000.

Kodama, Takashi: *See*—
Shiratori, Kazutoshi; Kodama, Takashi; Kawazoe, Mitsuo; Miyasaka, Tetsuo; and Nagao, Masaki, 4,598,986, Cl. 354-21.000.

Koehler, Gerard, to La Telemecanique Electrique. Polarized electromagnetic relay with a single-break switch. 4,599,589, Cl. 335-133.000.

Koetter, Joachim: *See*—
Klink, Gerhard; Kraske, Dietmar; Edinger, Egon; Koetter, Joachim; Krumrey, Klaus; Mayser, Jorg; and Michael, Ulrich, 4,598,459, Cl. 29-564.800.

Koga, Masao: *See*—
Tanaka, Akira; Miura, Hidetoshi; and Koga, Masao, 4,599,300, Cl. 430-411.000.

Kohaut, Gunter; Weber, Werner; Groenendijk, Herman; Poppelaars, Adrianus C.; and Janssen, Wilhelmus H. J., to Hoechst Aktiengesellschaft. Foamable plastics granules and packaging material prepared therefrom. 4,599,269, Cl. 428-397.000.

Kohlen, Rudolph: *See*—
Eichelsbacher, Michael; Kohlen, Rudolph; Reimert, Rainer; Hafke, Carl; and Schafer, Wolfgang, 4,599,092, Cl. 48-197.00R.

Kohler, Michael; and Petry, Wolfgang, to Bleistahl G.m.b.H. Process for the production of valve seat rings. 4,599,110, Cl. 75-243.000.

Kohmoto, Misao: *See*—
Izumi, Toshiaki; Noguchi, Kiyoshi; and Kohmoto, Misao, 4,599,280, Cl. 428-694.000.

Koide, Akio: *See*—
Makabe, Hachiro; Koide, Akio; Tachibana, Chijyo; and Yamamoto, Kazuji, 4,598,657, Cl. 112-275.000.

Koike, Shoji: *See*—
Yokoyama, Yasumasa; Komori, Tomoko; Eida, Tsuyoshi; Koike, Shoji; and Kobayashi, Masatsune, 4,599,112, Cl. 106-22.000.

Koike, Takeshi: *See*—
Taya, Shunroku; Koike, Takeshi; and Komatsu, Mitsuo, 4,599,516, Cl. 250-443.100.

Kojima, Shinji: *See*—
Yamamoto, Kaoru; Inoue, Takashi; Kojima, Shinji; and Nishimura, Sadahiro, 4,599,391, Cl. 526-282.000.

Kokan Kako Co., Ltd.: *See*—
Ohki, Takanosuke, 4,598,451, Cl. 29-159.200.

Kokusai Denshin Denwa Co., Ltd.: *See*—
Sakaki, Hiroshi; and Hashimoto, Kazuo, 4,599,691, Cl. 364-419.000.

Koleske, Joseph V., to Union Carbide Corporation. Low viscosity adducts of poly(active hydrogen) organic compounds and a polyepoxide. 4,599,401, Cl. 528-408.000.

Komatsu, Mitsuo: *See*—
Taya, Shunroku; Koike, Takeshi; and Komatsu, Mitsuo, 4,599,516, Cl. 250-443.100.

Komaya, Takashi: *See*—
Tamaru, Akio; Izumisawa, Yoshiaki; Hashimoto, Hidekichi; Kuma, Kiyoji; Komaya, Takashi; and Minagawa, Masanobu, 4,599,465, Cl. 568-781.000.

Komenda, Joseph G.: *See*—
Baran, Robert H.; Cioccio, Armand, deceased; Komenda, Joseph G.; and Hawkins, Ronald B., 4,599,745, Cl. 455-612.000.

Komoda, Yoshiyuki; Fukagawa, Hitoshi; Suzuki, Yoshiharu; and Tanaka, Osamu, to Matsushita Electric Works, Ltd. Data transmission system utilizing power line. 4,599,598, Cl. 340-310.00A.

Komori, Tomoko: *See*—
Yokoyama, Yasumasa; Komori, Tomoko; Eida, Tsuyoshi; Koike, Shoji; and Kobayashi, Masatsune, 4,599,112, Cl. 106-22.000.

Kompis, Ivan, to Hoffmann-La Roche Inc. Process for the preparation of aqueous solutions of potentiated sulfonamides. 4,599,416, Cl. 544-296.000.

Kon, Takao, to Tokyo Shibaura Denki Kabushiki Kaisha. Solid state imaging device with photoconductive layer. 4,599,637, Cl. 357-30.000.

Kondo, Masami: *See—*
Ishikawa, Masataka; and Kondo, Masami, 4,599,674, Cl. 361-154.000.

Kondo, Syuzi; Yamano, Akira; and Toei, Keiji, to Dainippon Screen Seizo K.K. Photosensitive material with two photosensitive layers for forming separate imaged elements. 4,599,295, Cl. 430-156.000.

Konishi, Akira, to Dai-Ichi Seiko Co., Ltd. Encapsulation molding apparatus. 4,599,062, Cl. 425-116.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Fujimaki, Yoshihide; Takei, Yoshiaki; Suzuki, Yasuo; and Nomori, Hiroyuki, 4,599,287, Cl. 430-59.000.
Haneda, Satoshi; Shoji, Hisashi; and Hiratsuka, Seiichiro, 4,599,285, Cl. 430-54.000.
Kambara, Jun; Ohmuro, Yuzo; and Kamogawa, Nin-ichi, 4,599,292, Cl. 430-122.000.
Yamada, Minoru; Ito, Eiji; and Nagai, Masaru, 4,598,989, Cl. 354-400.000.

Konopka, James: *See—*
Witte, Owen N.; Watanabe, Susan; and Konopka, James, 4,599,305, Cl. 435-7.000.

Konwitza, Vladimir, to TMC Corporation. Release ski binding. 4,598,928, Cl. 280-618.000.

Konzak, Peter. Bird scaring device. 4,598,660, Cl. 116-22.00A.

Kopf, Rowland J., to Uniset Corporation. Fastener driving tool. 4,598,851, Cl. 227-9.000.

Koppensteiner, Werner, to Otis Elevator Company. Sliding shoe system. 4,598,798, Cl. 187-95.000.

Koppers Company, Inc.: *See—*
Dressler, Hans, 4,599,464, Cl. 568-766.000.

Korbonits, Dezso : *See—*
Gonczi, Csaba; Korbonits, Dezso ; Palosi, Endre; Kiss, Pal; Heja, Gergely; Kun, Judit; Szomor nee Wundele, Maria; Szvoboda nee Kanzel, Ida; Marvanyos, Ede; Horvath, Karoly; Kovacs nee Mindler, Vera; and Nagy nee Koranyi, Livia, 4,599,428, Cl. 548-306.000.
Nogradi, Mihaly; Korbonits, Dezso ; Gottsegen, Agnes; Antus, Sandor; Furst, Zsuzsa; Knoll, Jozsef; Szejtli, Jozsef; Stadler, Agnes; Kovacs, Gabor; and Marmarosi, Katalin, 4,599,327, Cl. 514-58.000.

Korcz, William H.: *See—*
Hart, William W. C.; and Korcz, William H., 4,599,261, Cl. 428-213.000.

Korinek, Karl A.: *See—*
King, Peter F.; Farina, Samuel T.; and Korinek, Karl A., 4,599,116, Cl. 134-2.000.

Kornfeld, Edmund C.: *See—*
Nichols, Cynthia L.; and Kornfeld, Edmund C., 4,599,339, Cl. 514-267.000.

Korth, Gary E.: *See—*
Flinn, John E.; and Korth, Gary E., 4,599,060, Cl. 425-1.000.

Kosednar, Joseph: *See—*
Barth, Merlyn; and Kosednar, Joseph, 4,599,510, Cl. 235-449.000.

Kosnosky, Theodore P.: *See—*
Rice, Ronald B.; and Kosnosky, Theodore P., 4,599,676, Cl. 361-275.000.

Kotzur, Joachim, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Centrifugal-type slide ring seal. 4,598,913, Cl. 277-3.000.

Kovacs, Gabor: *See—*
Nogradi, Mihaly; Korbonits, Dezso ; Gottsegen, Agnes; Antus, Sandor; Furst, Zsuzsa; Knoll, Jozsef; Szejtli, Jozsef; Stadler, Agnes; Kovacs, Gabor; and Marmarosi, Katalin, 4,599,327, Cl. 514-58.000.

Kovacs nee Mindler, Vera: *See—*
Gonczi, Csaba; Korbonits, Dezso ; Palosi, Endre; Kiss, Pal; Heja, Gergely; Kun, Judit; Szomor nee Wundele, Maria; Szvoboda nee Kanzel, Ida; Marvanyos, Ede; Horvath, Karoly; Kovacs nee Mindler, Vera; and Nagy nee Koranyi, Livia, 4,599,428, Cl. 548-306.000.

Kowalski, William J.: *See—*
Schreiber, Alain B.; Kowalski, William J.; and Unger, Stefan H., 4,599,331, Cl. 514-179.000.

Koziol, Walter, to Modern Home Products Corp. Movable sight panel for cooking apparatus. 4,598,693, Cl. 126-41.00R.

Kozuki, Susumu; Takimoto, Hiroyuki; Edakubo, Hiroo; and Takayama, Nobutoshi, to Canon Kabushiki Kaisha. Video signal reproducing apparatus. 4,599,660, Cl. 360-77.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Hofmann, Peter-Jurgen, 4,599,278, Cl. 428-591.000.
Regnet, Gunther; Harrer, Josef; Ludtke, Lothar; and Weber, Robert, 4,598,436, Cl. 15-21.00R.
Weber, Robert; and Forner, Siegfried, 4,598,738, Cl. 138-89.000.

Krambrock, Wolfgang, to Krambrock, Wolfgang. Device for dosing loose material. 4,599,015, Cl. 406-66.000.

Kramer, Brian D.: *See—*
Clayton, Anthony B.; and Kramer, Brian D., 4,599,385, Cl. 525-285.000.

Kramer, Dennis M.: *See—*
Damiano, Michael A.; Kramer, Dennis M.; and Schmerda, Richard F., 4,599,555, Cl. 323-351.000.

Kraske, Dietmar: *See—*
Klink, Gerhard; Kraske, Dietmar; Edinger, Egon; Koetter, Joachim; Krumrey, Klaus; Mayser, Jorg; and Michael, Ulrich, 4,598,459, Cl. 29-564.800.

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DiSanto, Frank J.; and Krusos, Denis A., 4,598,960, Cl. 339-17.00M.

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Harada, Denzaburo, 4,598,545, Cl. 60-435.000.

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Nakatani, Kiyoshi; Numata, Satoshi; Inoue, Tsuneo; Hosono, Akira; Oda, Kengo; Kubota, Yutaka; Tachibana, Hajime; Udagawa, Takatoshi; and Gohbara, Masatoshi, 4,599,362, Cl. 514-721.000.

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Friebel, Gottfried O.; and Kulfan, Robert M., 4,598,886, Cl. 244-15.000.

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Kumar, Sampath, to Levy, Harold; Sorkin, Harry W.; Rogers, Edna Y.; and Bruno, Charles F. Method for recovery of stevioside. 4,599,403, Cl. 536-18.100.

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Michalak, Stanislaw; and Hermann, Bernd, 4,598,766, Cl. 165-104.160.

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Koehler, Gerard, 4,599,589, Cl. 335-133.000.
Thire, Jacques; and Souques, Georges, 4,599,633, Cl. 357-38.000.

LaBarbara, A. Franklin; Cann, Jeffrey; and Evans, Carey, to Phase Industries Inc. Holder assembly for miniature electronic components and method of fabrication. 4,598,821, Cl. 206-329.000.

Labarile, Paul, to Campbell Design Group, Inc. Security enclosure for a door frame. 4,598,495, Cl. 49-41.000.

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Muller, Arthur; and Richle, Walter, 4,599,405, Cl. 536-113.000.

Lachhein, Stephen; and Mildenberger, Hilmar, to Hoechst Aktiengesellschaft. Process for the preparation of phosphorus-containing cyanohydrin derivatives. 4,599,207, Cl. 558-137.000.

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Petit, Pierre; Grenier, Maurice; and Deschamps, Jean-Francois, 4,599,097, Cl. 62-36.000.

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Charles, Jean-Michel; and Roulland, Jean-Paul, 4,599,164, Cl. 210-86.000.

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Krupicka, William A.; Butts, Lawrence D.; and Lampley, Sidney J., 4,598,939, Cl. 292-92.000.

Landa, Benzion; Rosen, Josef; and Schneider, Avner, to Savin Corporation. Electrophotographic copier having readily removable drum and improved drive system therefor. 4,598,992, Cl. 355-3.0DR.

Landis, H. Richard; and Webster, Charles A., to Landis Plastics, Inc. Injection molding apparatus. 4,599,064, Cl. 425-185.000.

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Lane, Andrew: *See*—
Bean, Kenneth E.; Havemann, Robert H.; and Lane, Andrew, 4,599,247, Cl. 427-93.000.

Lanfer, Hermann, to Robert Bosch GmbH. Method and apparatus for optimizing a controllable adjustment parameter of a cyclically operating machine, particularly an internal combustion engine. 4,598,680, Cl. 123-425.000.

Lange, Arno; Kiehs, Karl; and Adolphi, Heinrich, to BASF Aktiengesellschaft. N-benzoyl-N'-phenylureas and their use for insect control. 4,599,356, Cl. 514-535.000.

Lange, Herman G.: *See*—
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Langen, Herbert; and Reuter, Fritz, to Eberspacher, J. Control device for metering pump. 4,599,052, Cl. 417-413.000.

Langley, Burton. Bag attachment and lawn mower apparatus. 4,598,536, Cl. 56-202.000.

Langley, Marion D.: *See*—
Franke, Eric; Kerber, Robert; and Langley, Marion D., 4,598,854, Cl. 228-48.000.

Lanier, Lewis; and Phillips, Joseph, to Becton, Dickinson and Company. Method for monitoring activated cell subpopulations. 4,599,304, Cl. 435-7.000.

Lanz, Otto, to BBC Brown, Boveri & Company, Limited. Method for detecting a disturbance along a conductor in an electricity-distribution system of the grid type. 4,599,556, Cl. 324-52.000.

Larson, Kevin. Ladder hoist attachment. 4,598,795, Cl. 182-129.000.

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Rol, Pascal, 4,598,984, Cl. 351-219.000.

Lathery, Willie M.: *See*—
Bell, Cecil R., Jr.; Lathery, Willie M.; Patel, Navin D.; and London, Jasper R., 4,598,817, Cl. 198-468.200.

Lattion, Andre , to Rieter Machine Works, Ltd. Bobbin inserting device. 4,598,881, Cl. 242-35.50A.

Lautenschlager, Hans-Heiner; Parnham, Michael J.; and Prop, Gerrit, to A. Nattermann & Cie GmbH. 1-O-alkyl-3-amino-propan-1.2-diol-2-O-phospholipids. 4,599,205, Cl. 558-170.000.

Lavallee, Francois A., to Essex Group, Inc. Tetraalkyl titanate modified nylon magnet wire insulation coating. 4,599,387, Cl. 525-419.000.

Lawless, William N.; and Clark, C. Frederick, Jr. Capacitive energy storage device for use at cryogenic temperatures. 4,599,677, Cl. 361-321.000.

Lawrence, Victor B.: *See*—
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Lear S.n.c. di Foggini & C.: *See*—
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Nobel, Fred I.; Ostrow, Barnet; and Schram, David N., 4,599,149, Cl. 204-44.400.

LeBlanc, James C. Vehicle. 4,598,785, Cl. 180-68.100.

Leck, Thomas J.: *See*—
Carlson, Dana P.; Kerbow, Dewey L.; Leck, Thomas J.; and Olson, Allan H., 4,599,386, Cl. 525-326.200.

Lecklider, Thomas H. Variable control device. 4,599,496, Cl. 200-1.00B.

Leclercq, Joseph; and Gagnard, Alain, to Framatome et Cogema. Nuclear fuel assembly with replaceable fuel elements. 4,599,213, Cl. 376-446.000.

Leder, Philip: *See*—
Hamer, Dean H.; Kaehler, Marian; and Leder, Philip, 4,599,308, Cl. 435-68.000.

Lee, Andrew O.; Muehlbauer, Heinz A.; and Blackburn, Keith. Briquette forming apparatus. 4,599,091, Cl. 44-11.000.

Lee C. Moore Corporation: *See*—
Woolslayer, Homer J.; Jenkins, Cecil; and Vogt, Dewayne G., 4,598,509, Cl. 52-118.000.

Lee, John Y.: *See*—
Wolfram, Joachim W.; and Lee, John Y., 4,599,435, Cl. 549-425.000.

Lee, Richard H. Light reflector system. 4,599,684, Cl. 362-346.000.

Leeper, Lloyd C.; and Mullen, C. Thomas, to Hershey Foods Corporation. Cutter and ejector for use in manufacture of licorice bites. 4,598,619, Cl. 83-117.000.

Lefebvre, Michel S., to Limit Instant Limited. Chemical modification of membrane to modify transport properties. 4,599,364, Cl. 521-53.000.

LeFever, Ronald S., to Harris Corporation. Technique for acquiring timing and frequency synchronization for modem utilizing known (non-data) symbols as part of their normal transmitted data format. 4,599,732, Cl. 375-13.000.

Leitner, Hans: *See*—
Dockner, Toni; Sauerwald, Manfred; Manegold, Jost H.; and Leitner, Hans, 4,599,202, Cl. 558-313.000.

Le Mahieu, Ronald A.: *See*—
Carson, Matthew; Le Mahieu, Ronald A.; Nason, William C.; and Tilley, Jefferson W., 4,599,336, Cl. 514-259.000.

Lenk, Rainer; Neuhaus, Harald; and Warner, Jurgen, to Mannesmann AG. Cleaning roller tracks of withdrawal stands in machines for continuous casting. 4,598,760, Cl. 164-158.000.

Lenz, Donald C.: *See*—
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Leonard, William L.: *See*—
Severs, Christopher W.; and Leonard, William L., 4,598,511, Cl. 52-157.000.

Lepera, Pasquale. Golf swing instructional aid. 4,598,911, Cl. 273-186.00A.

Leray, Yvon: *See*—
Brutel, Jean-Pierre; Leray, Yvon; and Quey, Louis, 4,598,880, Cl. 242-164.000.

Lesher, George Y.; Opalka, Chester J., Jr.; Page, Donald F.; and McGarry, Ruthann M., to Sterling Drug Inc. Preparation of 5-(hy-

droxy- and/or aminophenyl-6-lower-alkyl)-2(1H)-pyridinones. 4,599,423, Cl. 546-300.000.
Letard, Michel; Renouvin, Daniel; and Dupont, Joseph, to Societe Normande de Confection. Trolley for moving textile pieces between workstations. 4,598,919, Cl. 280-79.10R.
Lettau, Herbert: *See*—
Dautzenberg, Horst; Loth, Fritz; Borrmeister, Bodo; Bertram, Dieter; Lettau, Herbert; Stamberg, Jiri; and Peska, Jan, 4,599,209, Cl. 264-7.000.
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Levine, Barry F.: *See*—
Bethea, Clyde G.; Capasso, Federico; Hutchinson, Albert L.; Levine, Barry F.; and Tsang, Won-Tien, 4,599,632, Cl. 357-30.000.
Levine, Leonard. Apparatus for extending rear view mirror. 4,598,982, Cl. 350-626.000.
Levitt, George, to Du Pont de Nemours, E. I., and Company. Agricultural ureas and isoureas. 4,599,103, Cl. 71-90.000.
Levy, Harold: *See*—
Kumar, Sampath, 4,599,403, Cl. 536-18.100.
Lew, Hyok S.; Lew, Hyon S.; and Lew, Yon K. Sky-ride vertical mobility system. 4,598,792, Cl. 182-42.000.
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Lewis, Gary K.; and Zisserson, Melvin, to Litton Systems, Inc. Device for switching a dielectric-resonator-stabilized oscillator on and off. 4,599,582, Cl. 331-117.00D.
Lewis, Kenrick M.: *See*—
Kanner, Bernard; and Lewis, Kenrick M., 4,599,441, Cl. 556-469.000.
Lewis, Leroy C.; and Trammell, David R., to United States of America, Energy. Disposable rabbit. 4,599,517, Cl. 250-506.100.
Leyrer, Reinhold J.: *See*—
Eckell, Albrecht; Elzer, Albert; Hoffmann, Gerhard; Leyrer, Reinhold J.; and Werther, Heinz-Ulrich, 4,599,293, Cl. 430-126.000.
LGZ Landis & Gyr Zug AG: *See*—
Stratil, Tomas; Pisinger, Milos; and Fehr, Peter, 4,598,858, Cl. 228-180.100.
L'Henaff, Patrick: *See*—
Bricaud, Herve ; Rouffy, Jean C.; and L'Henaff, Patrick, 4,598,965, Cl. 339-75.0MP.
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Csizmadia, Lajos, 4,598,923, Cl. 280-287.000.
Lichtenberger, Gyorgy. Trachea cannula. 4,598,705, Cl. 128-200.260.
Lieberman, Ephraim: *See*—
Bordoni, Maurice E.; and Lieberman, Ephraim, 4,598,704, Cl. 128-200.140.
Lieuse Technology Limited: *See*—
Fenwick, Robert, 4,598,921, Cl. 280-242.0WC.
Lightwave Technologies, Inc.: *See*—
Sarkar, Arnab, 4,599,098, Cl. 65-3.120.
Liljekvist, Bernt S.; Nordmark, Bo Carl G.; and Tukala, Tommy S., to Santrade Limited. Rock drill bit. 4,598,779, Cl. 175-410.000.
Lilla, James A. Cantilevered suspension sling. 4,598,702, Cl. 128-94.000.
Limburg, William W.; and Renfer, Dale S., to Xerox Corporation. Photoconductive imaging member with stabilizer in charge transfer layer. 4,599,286, Cl. 430-59.000.
Limit Instant Limited: *See*—
Lefebvre, Michel S., 4,599,364, Cl. 521-53.000.
Lindahl, Jonas A. I., to Mooch Domsjo Aktiebolag. Process for pretreating particulate lignocellulosic material to remove heavy metals. 4,599,138, Cl. 162-19.000.
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Burr, Peter S., 4,599,096, Cl. 62-27.000.
Lindemann, Peer, to Rolyan Manufacturing Co. Inc. Hemi-arm sling. 4,598,703, Cl. 128-94.000.
Lindman, Bjorn: *See*—
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Litton Precision Products International GmbH: *See*—
Rammelsberg, Gert-Dieter, 4,599,601, Cl. 340-347.00P.
Litton Systems, Inc.: *See*—
Lewis, Gary K.; and Zisserson, Melvin, 4,599,582, Cl. 331-117.00D.
Liu, Jeffrey; and Tong, Chun H. Disk drive system apparatus band actuator. 4,599,666, Cl. 360-106.000.
Liu, Tung: *See*—
Kiwak, Robert S.; and Liu, Tung, 4,598,457, Cl. 29-411.000.
Liu, Wan-Li, to General Electric Company, Silicone Products Division. Silicone-modified PVC. 4,599,381, Cl. 525-104.000.
Llenado, Ramon A., to Procter & Gamble Company, The. Foaming surfactant compositions. 4,599,188, Cl. 252-174.170.
Loch, Werner; Schupp, Eberhard; Osterloh, Rolf; Dobbelstein, Arnold; and Ahlers, Klaas, to BASF Aktiengesellschaft. Preparation of self-crosslinking synthetic resins. 4,599,371, Cl. 523-402.000.
Lock, Colin J. L.: *See*—
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Lockheed Corporation: *See*—
Frink, Attila; and Morrison, Robert A., 4,598,964, Cl. 339-37.000.
Loeffler, Hans-Peter: *See*—
Seufert, Walter; Loeffler, Hans-Peter; Schirmer, Ulrich; Seppelt, Wolfgang; and Adolphi, Heinrich, 4,599,329, Cl. 514-119.000.
Logie, Frank M.; and Phillips, Ronald, to Lucas Industries public limited company. Fuel pumping apparatus. 4,598,685, Cl. 123-506.000.
Lohnherr, Ludger: *See*—
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Lombard, Gerard, to Essilor International Cie Generale d'Optique. Method and apparatus for surfacing optical lenses. 4,598,502, Cl. 51-284.00R.
Lonardi, Emile: *See*—
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London, Jasper R.: *See*—
Bell, Cecil R., Jr.; Lathery, Willie M.; Patel, Navin D.; and London, Jasper R., 4,598,817, Cl. 198-468.200.
Long, Jerry M.; and Womack, James A., to Innovative Concepts, Inc. Storage container for floppy disks and the like. 4,598,824, Cl. 206-444.000.
Long, John V.: *See*—
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Long, Theron. Electrical receptacle unit. 4,598,968, Cl. 339-126.00R.
Long, William D., to Kennecott Corporation. Components for internal combustion engines. 4,598,675, Cl. 123-90.510.
Longtin, Donald J.: *See*—
Ross, Richard H., Jr.; and Longtin, Donald J., 4,599,037, Cl. 414-752.000.
Loth, Fritz: *See*—
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Lotsch, Wolfgang; and Henning, Georg, to BASF Aktiengesellschaft. Isoindoline pigment having a high color strength. 4,599,113, Cl. 106-288.00Q.
Love, Robert P., to General Electric Company. Methods of making self-aligned power MOSFET with integral source-base short. 4,598,461, Cl. 29-571.000.
Lubrizol Corporation, The: *See*—
Steckel, Thomas F., 4,599,090, Cl. 44-63.000.
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Logie, Frank M.; and Phillips, Ronald, 4,598,685, Cl. 123-506.000.
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Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,599,237, Cl. 426-535.000.
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Regnet, Gunther; Harrer, Josef; Ludtke, Lothar; and Weber, Robert, 4,598,436, Cl. 15-21.00R.
Ludwig Heumann & Co., GmbH: *See*—
Schickaneder, Helmut; Postius, Stefan; Herter, Rolf; Morsdorf, Peter; Szelenyi, Istvan; and Ahrens, Kurt H., 4,599,346, Cl. 514-317.000.
Luginbuhl, Otto, to Habegger, Willy. Clamping device for cables and rope. 4,598,442, Cl. 24-132.00R.
Lukens, William E.; and DeNale, Robert, to United States of America, Navy. Flexible trailing shield for welding reactive metals. 4,599,505, Cl. 219-74.000.
Lundgren, Bengt: *See*—
Ostling, Sture; and Lundgren, Bengt, 4,598,443, Cl. 24-136.00R.
Lupoli, Peter J.; Mattis, Donald J.; and Miller, Robert S., to Casco Products Inc. Fuel vapor recovery system for automotive vehicles. 4,598,686, Cl. 123-519.000.
Lurssen, Klaus: *See*—
Thomas, Rudolf; Eue, Ludwig; Schmidt, Robert; and Lurssen, Klaus, 4,599,448, Cl. 564-214.000.
Luton, Michael J., to Exxon Research and Engineering Co. Dispersion strengthened extruded metal products substantially free of texture. 4,599,214, Cl. 419-4.000.
Lutz, Gerhard, to Siemens Aktiengesellschaft. Method of making an electrical plug connection. 4,598,474, Cl. 29-863.000.
Luxemburg, S. Roy. Process for the decontamination of oil-contaminated particulate solids. 4,599,117, Cl. 134-25.100.
M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Kotzur, Joachim, 4,598,913, Cl. 277-3.000.
M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft: *See*—
Fischer, Hermann, 4,598,641, Cl. 101-246.000.
Nawrath, Nikolaus, 4,598,640, Cl. 101-177.000.
Schneider, Eckhard; and Purkl, Walter, 4,598,902, Cl. 271-205.000.
Winterholler, Johann; Plantsch, Josef; and Fischer, Petra, 4,598,850, Cl. 226-92.000.
Ma-Ma Macaroni Co., Ltd.: *See*—
Saitoh, Hiroshi; Kadooka, Katsuyuki; Tsukamoto, Mamoru; Ono, Shoji; and Ohkawa, Masaki, 4,599,238, Cl. 426-557.000.
Ma, Sung S. Footwear. 4,598,484, Cl. 36-3.00R.
Maccecchini, Maria-Luisa, to International Minerals & Chemical Corp. Method of promoting animal growth using antibodies against somatostatin. 4,599,229, Cl. 424-85.000.

Machler, Meinrad; Machler, Sibylle; and Sachse, Richard, to Carl-Zeiss-Stiftung. Instrument for spectral measurement in the bloodstream. 4,598,715, Cl. 128-634.000.

Machler, Sibylle: *See*—
Machler, Meinrad; Machler, Sibylle; and Sachse, Richard, 4,598,715, Cl. 128-634.000.

MacInnis, Martin B.: *See*—
Douglas, Alan D.; MacInnis, Martin B.; and Reilly, Kenneth T., 4,599,222, Cl. 423-49.000.
Douglas, Alan D.; Reilly, Kenneth T.; MacInnis, Martin B.; Powers, John A.; and Christini, James N., 4,599,223, Cl. 423-49.000.
Vanderpool, Clarence D.; and MacInnis, Martin B., 4,599,224, Cl. 423-606.000.

MacKenzie, Mark L.: *See*—
Wise, Sean; and MacKenzie, Mark L., 4,599,211, Cl. 264-82.000.

Maeshima, Katsuyoshi: *See*—
Tomosada, Masahiro; Maeshima, Katsuyoshi; Inuzuka, Tsuneki; and Sakamaki, Hisashi, 4,598,994, Cl. 355-14.00R.

Maggioni, Paolo; Minisci, Francesco; and Correale, Mariano, to Brichima Spa. Process for the synthesis of o-isopropoxyphenol. 4,599,461, Cl. 568-652.000.

Mahr, Rene ; and Lonardi, Emile, to Paul Wurth S.A. Installation for charging a shaft furnace. 4,599,028, Cl. 414-206.000.

Maier, Herman F. L.: *See*—
Doring, Michael; Bentin, Horst K.; and Maier, Herman F. L., 4,599,628, Cl. 346-140.00R.

Makabe, Hachiro; Koide, Akio; Tachibana, Chijyo; and Yamamoto, Kazuji, to Janome Sewing Machine Co. Ltd. Needle position indicating device for a sewing machine. 4,598,657, Cl. 112-275.000.

Makino, Ayumu: *See*—
Tsuge, Takeyoshi; Torisawa, Yoshihiro; Makino, Ayumu; and Kimura, Tsutomu, deceased, 4,599,629, Cl. 346-140.00R.

Malcolm-Brown, Tessa, to Dixon International Limited. Intumescent composition. 4,599,369, Cl. 523-179.000.

Maldavs, Ojars, to Imperial Clevite Inc. Quick disconnect coupling. 4,598,896, Cl. 251-149.600.

Malhotra, Sudarshan K.; and Gerwick, B. Clifford, III, to Dow Chemical Company, The. 2-[16-(3-fluoro-5-trifluoromethyl-pyridinyl-2-oxy)-3-nitro-phenoxy]-propionic acid derivatives, herbicidal compositions containing same and herbicidal method of use. 4,599,105, Cl. 71-94.000.

Mally, Timothy G.: *See*—
Borsuk, Alvin; Mally, Timothy G.; and Rattmann, James A., 4,599,025, Cl. 414-82.000.

Maloney, James E., to Diamond Shamrock Chemicals Company. Composition for drinking secondary fibers. 4,599,190, Cl. 252-174.240.

Mamelak, Mortimer: *See*—
Kluger, Ronald; and Mamelak, Mortimer, 4,599,355, Cl. 514-533.000.

Manabe, Masahiro; Nagafuchi, Eiichi; and Nohara, Yoshio, to Bridgestone Corporation. Heating device for use in vulcanizing apparatus. 4,599,061, Cl. 425-41.000.

Mandekic, Anthony V. Vehicle tire with traction means. 4,598,749, Cl. 152-210.000.

Manegold, Jost H.: *See*—
Dockner, Toni; Sauerwald, Manfred; Manegold, Jost H.; and Leitner, Hans, 4,599,202, Cl. 558-313.000.

Mannesmann AG: *See*—
Lenk, Rainer; Neuhaus, Harald; and Warner, Jurgen, 4,598,760, Cl. 164-158.000.

Mannesmann Aktiengesellschaft: *See*—
Wessel, Otto, 4,598,836, Cl. 220-3.000.

Manola, Umberto, to Proteins Technology S.p.A., The. Device for the separation of the components of edible meal. 4,599,163, Cl. 209-139.00A.

Manthe, Karl-Heinz: *See*—
Preuss, Bernhard; and Manthe, Karl-Heinz, 4,599,590, Cl. 335-175.000.

Manto, Hiromune: *See*—
Kawai, Nobuyasu; Hirano, Minoru; Manto, Hiromune; Esaka, Hajime; and Fujimoto, Hirofumi, 4,599,109, Cl. 75-238.000.

Manzoni Bouchot: *See*—
Manzoni, Stephane, 4,598,605, Cl. 74-501.00M.

Manzoni, Stephane, to Manzoni Bouchot. Mechanism with torque-limiting device for controlling a rearview-mirror. 4,598,605, Cl. 74-501.00M.

Marcel, Francois: *See*—
Surie, Serge; and Marcel, Francois, 4,599,735, Cl. 375-54.000.

Marciandi, Franco: *See*—
Berte', Ferruccio; Marciandi, Franco; and Binaghi, Marco, 4,599,375, Cl. 524-100.000.

Marianu, Vlad, to ITT Industries, Inc. Automatic adjusting device for a disc brake. 4,598,800, Cl. 188-71.900.

Mark, Victor, to General Electric Company. Process for the preparation of bisphenols. 4,599,463, Cl. 568-723.000.

Marmarosi, Katalin: *See*—
Nogradi, Mihaly; Korbonits, Dezso ; Gottsegen, Agnes; Antus, Sandor; Furst, Zsuzsa; Knoll, Jozsef; Szejtli, Jozsef; Stadler, Agnes; Kovacs, Gabor; and Marmarosi, Katalin, 4,599,327, Cl. 514-58.000.

Marquip, Inc.: *See*—
Thomas, Richard H., 4,598,901, Cl. 271-202.000.

Marshall, Richard S.: *See*—
Fryer, Douglas M.; Hayes, Frederick W.; and Marshall, Richard S., 4,599,073, Cl. 441-80.000.

Marsing, Helmut, to Siemens Aktiengesellschaft. Device for holding the housing of a superconducting magnet winding. 4,599,592, Cl. 335-216.000.

Martin Engineering Company: *See*—
Swinderman, Robert T., 4,598,823, Cl. 198-497.000.

Martin, Robert A., to General Motors Corporation. Vehicle headlamp beam control. 4,599,544, Cl. 315-83.000.

Martini, Francesco, to W. R. Grace & Co., Cryovac Div. Heat-sterilizable laminate films. 4,599,276, Cl. 428-520.000.

Marttila, Esko V.: *See*—
Marvola, Martti L. A.; Marttila, Esko V.; Uotila, Jaakko A.; Pippuri, Aino K.; Kairisalo, Pekka J.; and Honkanen, Erkki J., 4,599,326, Cl. 514-29.000.

Maruyama, Yutaka; Negishi, Junji; Murata, Katuyoshi; and Katsuhara, Yutaka. Process of purifying fluorinated carbonyl compound mixed with hydrogen fluoride. 4,599,455, Cl. 568-411.000.

Marvanyos, Ede: *See*—
Gonczi, Csaba; Korbonits, Dezso ; Palosi, Endre; Kiss, Pal; Heja, Gergely; Kun, Judit; Szomor nee Wundele, Maria; Szvoboda nee Kanzel, Ida; Marvanyos, Ede; Horvath, Karoly; Kovacs nee Mindler, Vera; and Nagy nee Koranyi, Livia, 4,599,428, Cl. 548-306.000.

Marvola, Martti L. A.; Marttila, Esko V.; Uotila, Jaakko A.; Pippuri, Aino K.; Kairisalo, Pekka J.; and Honkanen, Erkki J., to Orion-yhtyma Oy. Acetyl erythromycin stearate, and compositions containing it. 4,599,326, Cl. 514-29.000.

Massachusetts Institute of Technology: *See*—
Jenssen, Hans P., 4,599,727, Cl. 372-41.000.

Masterson, Ian F., to Union Carbide Corporation. Method for controlling secondary top-blown oxygen in subsurface pneumatic steel refining. 4,599,107, Cl. 75-59.200.

Masuda, Akira: *See*—
Ohmori, Toshihiko; Sumitani, Sinya; Tani, Takio; Miyaki, Masahiko; and Masuda, Akira, 4,598,683, Cl. 123-450.000.

Masumoto, Katashi: *See*—
Nakatani, Isao; and Masumoto, Katashi, 4,599,184, Cl. 252-62.510.

Matake, Shigeru: *See*—
Sugiuchi, Masami; Miyamura, Masataka; Imai, Atsuo; and Matake, Shigeru, 4,598,979, Cl. 350-357.000.

Mather, John M.: *See*—
Billig, Ernst; Abatjoglou, Anthony G.; Bryant, David R.; Murray, Rex E.; Mather, John M.; and Hsu, Song K., 4,599,059, Cl. 418-236.000.
Billig, Ernst; Abatjoglou, Anthony G.; Bryant, David R.; Murray, Rex E.; and Mather, John M., 4,599,206, Cl. 558-85.000.

Matson, James A.; and Bush, James A., to Bristol-Myers Company. Process for producing antitumor antibiotic compound. 4,599,310, Cl. 435-71.000.

Matsuda, Yasuo: *See*—
Hombu, Mitsuyuki; Ueda, Shigeta; Suzuki, Katsunori; and Matsuda, Yasuo, 4,599,685, Cl. 363-41.000.

Matsui, Shigetomo, to Kawasaki Jukogyo Kabushiki Kaisha. Method of producing double-wall composite pipes. 4,598,857, Cl. 228-132.000.

Matsumoto, Shuntaro: *See*—
Ishihara, Yoshinobu; Minami, Kazuya; and Matsumoto, Shuntaro, 4,598,761, Cl. 164-263.000.

Matsumoto, Tohru; and Yamazaki, Masuo, to Canon Kabushiki Kaisha. Particles obtained by atomization while applying voltage. 4,599,294, Cl. 430-137.000.

Matsuno, Keishi, to Iwatsu Electric Co., Ltd. Level compensation circuit. 4,599,571, Cl. 330-11.000.

Matsuo, Kenji; and Tanaka, Fuminari, to Tokyo Shibaura Denki Kabushiki Kaisha. Analog switch circuit having output offset compensation circuit. 4,599,522, Cl. 307-576.000.

Matsuo Kogyo Co., Ltd.: *See*—
Fujigiwa, Chikara; and Sasabe, Minoru, 4,598,879, Cl. 242-84.50R.

Matsuo, Yuichi: *See*—
Fuchigami, Masao; and Matsuo, Yuichi, 4,598,756, Cl. 164-37.000.

Matsuoka, Shigeru, to Hitachi, Ltd. Circuit preventing phantom input in a switch matrix. 4,599,608, Cl. 340-365.00S.

Matsushita Electric Industrial Co., Ltd.: *See*—
Matzuzawa, Akira; and Inoue, Michihiro, 4,599,602, Cl. 340-347.0AD.
Nagai, Kazutoshi; Aoyagi, Hirofumi; Nasu, Ichiro; and Watanabe, Shinichi, 4,598,431, Cl. 4-420.200.
Taniuchi, Tetsuo, 4,598,996, Cl. 356-43.000.
Ueda, Snigeki, 4,599,503, Cl. 219-10.55B.

Matsushita Electric Works, Ltd.: *See*—
Komoda, Yoshiyuki; Fukagawa, Hitoshi; Suzuki, Yoshiharu; and Tanaka, Osamu, 4,599,598, Cl. 340-310.00A.

Mattei, Riccardo; and Belvederi, Bruno, to G. D Societa' Per Azioni. Cigarette manufacturing machine. 4,598,719, Cl. 131-84.100.

Mattis, Donald J.: *See*—
Lupoli, Peter J.; Mattis, Donald J.; and Miller, Robert S., 4,598,686, Cl. 123-519.000.

Mattison, Phillip L.; and Krbechek, LeRoy, to Henkel Corporation. Process of preparing hydroxyarylaldehydes. 4,599,457, Cl. 568-433.000.

Matuszak, John J., to Owens-Illinois, Inc. Delabeler for plastic containers. 4,599,131, Cl. 156-584.000.

Matzuzawa, Akira; and Inoue, Michihiro, to Matsushita Electric Industrial Co., Ltd. Serial-type A/D converter utilizing folding circuit cells. 4,599,602, Cl. 340-347.0AD.

Max Planck Gesellschaft zur Forderung der Wissenschaften e.V.: *See*—
Wunsch, Erich, 4,599,407, Cl. 544-85.000.

Mayser, Jorg: *See*—
Klink, Gerhard; Kraske, Dietmar; Edinger, Egon; Koetter, Joachim; Krumrey, Klaus; Mayser, Jorg; and Michael, Ulrich, 4,598,459, Cl. 29-564.800.

Mazin, Moshe, to Raytheon Company. Read only memory circuit. 4,599,704, Cl. 365-104.000.

Mazur, Richard J.: *See*—
Wood, James A.; and Mazur, Richard J., 4,598,953, Cl. 303-3.000.

Mazur, Robert H.: *See*—
Hansen, Donald W., Jr.; Mazur, Robert H.; and Pilipauskas, Daniel R., 4,599,325, Cl. 514-19.000.

McAllester, Spears L., to Kendall Company, The. Surgical drape with fluid collection bag. 4,598,458, Cl. 128-132.00D.

McCann, Kenneth D., to U.S. Philips Corporation. Frequency synthesizer having jitter compensation. 4,599,579, Cl. 331-1.00R.

McConnell, William P., to Westinghouse Electric Corp. Assembly system for electronic circuit boards. 4,598,456, Cl. 29-407.000.

McDonnell Douglas Corporation: *See*—
Brown, Raymond E.; Dillard, Homer E.; Green, James W.; and McIntosh, Stuart A., 4,599,645, Cl. 358-104.000.

McDowell, Curtis S., to Polybac Corporation. Submerged fixed film biological treatment system. 4,599,174, Cl. 210-614.000.

McFarland, Timothy M.; and Garavaglia, Arthur E., to Kimberly-Clark Corporation. Packaging of absorbent products. 4,598,528, Cl. 53-430.000.

McGarry, Ruthann M.: *See*—
Lesher, George Y.; Opalka, Chester J., Jr.; Page, Donald F.; and McGarry, Ruthann M., 4,599,423, Cl. 546-300.000.

McGehee, John, to Ukiah Machine & Welding Inc. Magnetic saw chuck. 4,598,916, Cl. 279-1.00M.

McGehee, Wallace L. Bone emulsifying apparatus. 4,598,636, Cl. 99-353.000.

McGillivray, Terrence L.; and Coull, Thomas B., to Bechtel International Corporation. Buoyant guyed tower. 4,599,014, Cl. 405-225.000.

McGown, Jack A. Flashing member. 4,598,505, Cl. 52-58.000.

McGuire, Donald W.; and Cordes, Harry B., to Red Lion Controls. Conversion of quadrature signals into counter control pulses. 4,599,600, Cl. 340-347.00P.

McIntosh, Stuart A.: *See*—
Brown, Raymond E.; Dillard, Homer E.; Green, James W.; and McIntosh, Stuart A., 4,599,645, Cl. 358-104.000.

McKane, Francis W., Jr.: *See*—
Grossman, Richard F.; and McKane, Francis W., Jr., 4,599,370, Cl. 523-200.000.

McKay, William R.: *See*—
Dickens, Jonathan P.; Donald, David K.; Kneen, Geoffrey; and McKay, William R., 4,599,361, Cl. 514-575.000.

McKenzie, James A.; and Peterson, Joe W., to Motorola, Inc. A/D Self-testing circuit. 4,599,604, Cl. 340-347.0AD.

McKinney, Osborne K.; Flores, David P.; and Eversdyk, David A., to Dow Chemical Company, The. Interpolymers of ethylene and unsaturated carboxylic acids. 4,599,392, Cl. 526-318.600.

McMahan, David R.; and Nicholas, Richard W., to General Motors Corp. Vehicle headlamp assembly. 4,599,681, Cl. 362-80.000.

McMaster, Robert C., to JACA Corporation. Apparatus for determining the fatigue condition of a structure. 4,598,592, Cl. 73-786.000.

McMullin, Wayne A., to Rockwell International Corporation. Quadrupole-magnetic-pump-field free electron laser. 4,599,724, Cl. 372-2.000.

McMurtry, David R., to Renishaw plc. Position-sensing apparatus. 4,599,524, Cl. 307-119.000.

McNett, John P., to Coleco Industries, Inc. Simulated rotating light for children's vehicles and the like. 4,598,976, Cl. 350-79.000.

Mecanum Innovation AB: *See*—
Ilon, Bengt E., 4,598,782, Cl. 180-7.100.

Medemblik, J. John, to Walinga Body & Coach Limited. Cyclone apparatus for pneumatically moving granular matter. 4,599,016, Cl. 406-67.000.

Meermans, Matheus J. M., to U.S. Philips Corporation. Magnetic-tape cassette having an element for cleaning a tape drive capstan during normal operation. 4,599,669, Cl. 360-132.000.

Megatool Inc.: *See*—
Hemmings, David T., 4,598,822, Cl. 206-379.000.

Meinert, Hartmut: *See*—
Wieland, Dieter; Meinert, Hartmut; and Pohl, Hans-Ulrich, 4,599,239, Cl. 426-590.000.

Menconi, Augusto: *See*—
Bosone, Enrico; Caprara, Giuseppe; Corda, Francesco; Gozzo, Franco; Menconi, Augusto; Piccardi, Paolo; and Caprioli, Vincenzo, 4,599,358, Cl. 514-521.000.

Merck & Co., Inc.: *See*—
Halczenko, Wasyl; and Hartman, George D., 4,599,341, Cl. 514-282.000.

Merger, Franz: *See*—
Fischer, Rolf; Hoelderich, Wolfgang; Merger, Franz; Mross, Wolf D.; and Weitz, Hans-Martin, 4,599,458, Cl. 568-450.000.

Metal Box Public Limited Company: *See*—
Brownbill, Thomas D., 4,598,835, Cl. 215-307.000.

Metalem S.A.: *See*—
Feller, Gilbert, 4,599,251, Cl. 428-156.000.

Metromedia, Inc.: *See*—
Rich, Leonard G., 4,599,626, Cl. 346-140.00R.

Metzger, Karl G.: *See*—
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,599,334, Cl. 514-253.000.

Meunier, Gilles: *See*—
Vio, Lino; and Meunier, Gilles, 4,599,180, Cl. 252-8.55D.

Meyer, Bruno; and Nold, Peter, to Valutec AG. Hand grip controlled, user assisted raising chair. 4,598,944, Cl. 297-183.000.

Meyer, Gerhard: *See*—
Kersten, Hilde; and Meyer, Gerhard, 4,599,467, Cl. 568-867.000.

Meyer, Nicolas; and Cousin, Michel, to Societe Chimique des Charbonnages S.A. Laminates having an improved finishing layer. 4,599,212, Cl. 264-255.000.

Meyer, Norbert: *See*—
Rentzea, Costin; Buschmann, Ernst; Meyer, Norbert; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,599,335, Cl. 514-255.000.

Michael, Ulrich: *See*—
Klink, Gerhard; Kraske, Dietmar; Edinger, Egon; Koetter, Joachim; Krumrey, Klaus; Mayser, Jorg; and Michael, Ulrich, 4,598,459, Cl. 29-564.800.

Michalak, Stanislaw; and Hermann, Bernd, to L. & C. Steinmuller GmbH. Column-type regenerative gas-gas heat exchanger with heat-transferring elements. 4,598,766, Cl. 165-104.160.

Michl, Josef, to University of Utah. Methods for making solid solutions from normally immiscible components and for modifying the surface structure of solid materials. 4,599,462, Cl. 568-702.000.

Micro Communications, Inc.: *See*—
Vaughan, Thomas J., 4,599,744, Cl. 455-129.000.

Microlife Technics, Inc.: *See*—
Gonzalez, Carlos F., 4,599,313, Cl. 435-253.000.

Microwave Ovens Limited: *See*—
Eke, Kenneth I., 4,598,689, Cl. 126-21.00A.

Midwest Research Institute: *See*—
Kimmel, Albert L.; Chappelow, Cecil C., Jr.; and Castelli, Vincent J., 4,599,368, Cl. 523-122.000.

Mielityinen-Tiitto, Kirsti I.: *See*—
Tiitto, Seppo I.; and Mielityinen-Tiitto, Kirsti I., 4,599,563, Cl. 324-232.000.

Migliori, Albert: *See*—
Wheatley, John C.; Swift, Gregory W.; and Migliori, Albert, 4,599,551, Cl. 322-2.00R.

Migrin, Robert S., to United Technologies Automotive, Inc. Switch actuating mechanism having resilient means for displacement transmission. 4,599,501, Cl. 200-156.000.

Mikuni Kogyo Kabushiki Kaisha: *See*—
Miyano, Takashi; and Miyano, Takashi, 4,598,682, Cl. 123-440.000.

Milberger, Ernest C.; and Wong, Eunice K. T., to Standard Oil Company, The. Nitrogenation of hydrocarbons, including the production of maleimide. 4,599,430, Cl. 548-548.000.

Mildenberger, Hilmar: *See*—
Lachhein, Stephen; and Mildenberger, Hilmar, 4,599,207, Cl. 558-137.000.

Miles, John J., Jr.; and DeMasi, Dominick F., to Lever Brothers Company. Method for wetting and dispersing powders. 4,599,363, Cl. 514-770.000.

Miles Laboratories, Inc.: *See*—
Silver, Lester; and Goldenberg, Barry, 4,599,340, Cl. 514-277.000.

Milich, David R.; and Chisari, Frank V., to Scripps Clinic and Research Foundation. Synthetic hepatitis B virus vaccine including both T cell and B cell determinants. 4,599,230, Cl. 424-89.000.

Milich, David R.; and Chisari, Frank V., to Scripps Clinic and Research Foundation. Synthetic hepatitis B virus vaccine including both T cell and B cell determinants. 4,599,231, Cl. 424-89.000.

Miller, Gerald D.: *See*—
Hausman, Mary L.; Miller, Gerald D.; and Wempe, Lawrence K., 4,599,378, Cl. 524-554.000.

Miller, Jack E., to Harry Major Machine & Tool Co. Accumulating conveyor. 4,598,818, Cl. 198-803.200.

Miller, Jack V.; and Miller, Ruth E. Manufacture of decorated ovoid figurines. 4,599,235, Cl. 426-250.000.

Miller-Jones, Stockton M.: *See*—
Riley, James K.; and Miller-Jones, Stockton M., 4,598,589, Cl. 73-609.000.

Miller, Kevin P.: *See*—
Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,599,237, Cl. 426-535.000.

Miller, Robert S.: *See*—
Lupoli, Peter J.; Mattis, Donald J.; and Miller, Robert S., 4,598,686, Cl. 123-519.000.

Miller, Ruth E.: *See*—
Miller, Jack V.; and Miller, Ruth E., 4,599,235, Cl. 426-250.000.

Milligan, Timothy H.; and Johnson, Robert B., to Willamette Industries, Inc. System for boxing forms. 4,598,526, Cl. 53-251.000.

Milling, Gunnar S., to Aktiebolaget Electrolux. Filling nozzle. 4,598,743, Cl. 141-296.000.

Miln, James P., to Pirelli Limited. Seating platform. 4,598,949, Cl. 297-452.000.

Milstein, Joseph B.: *See*—
Jewett, David N.; Bates, Herbert E.; and Milstein, Joseph B., 4,599,132, Cl. 156-617.00H.

Minagawa, Masanobu: *See*—
Tamaru, Akio; Izumisawa, Yoshiaki; Hashimoto, Hidekichi; Kuma, Kiyoji; Komaya, Takashi; and Minagawa, Masanobu, 4,599,465, Cl. 568-781.000.

Minagawa, Shoichi: *See*—
Okamoto, Takeshi; and Minagawa, Shoichi, 4,599,532, Cl. 310-313.00D.

Minakawa, Yoshimitsu: *See—*
Saito, Isao; Ishibashi, Yoji; Ohmori, Takashi; Minakawa, Yoshimitsu; and Kuroda, Michio, 4,598,553, Cl. 60-733.000.

Minami, Kazuya: *See—*
Ishihara, Yoshinobu; Minami, Kazuya; and Matsumoto, Shuntaro, 4,598,761, Cl. 164-263.000.

Mineral Research and Development Corp.: *See—*
Rose, John T., 4,599,192, Cl. 252-383.000.

Minisci, Francesco: *See—*
Maggioni, Paolo; Minisci, Francesco; and Correale, Mariano, 4,599,461, Cl. 568-652.000.

Minks, Werner, to International Standard Electric Corporation. Tilting armature relay with adjustable contact pressure. 4,599,593, Cl. 335-274.000.

Minnesota Mining and Manufacturing Co.: *See—*
Eian, Gilbert L.; and Trend, John E., 4,599,273, Cl. 428-412.000.
Esmay, Donald L., 4,599,265, Cl. 428-355.000.
Fisch, Richard S., 4,599,298, Cl. 430-271.000.
Shinbach, Madeline P., 4,598,826, Cl. 206-620.000.
Truskolaski, Bernard S.; and Pohl, Daniel P., 4,599,260, Cl. 428-207.000.

Minolta Camera Kabushiki Kaisha: *See—*
Kobayashi, Hiroshi, 4,598,977, Cl. 350-162.200.

Mionskowski, Gerhard: *See—*
Hansjurgens, Achim; and Mionskowski, Gerhard, 4,598,713, Cl. 128-421.000.

Mirra, Michael J.; Headrick, Jon W.; and Giuliani, Raymond E., to Ball Corporation. Zinc alloy for reducing copper-zinc diffusion. 4,599,279, Cl. 428-658.000.

Mis, Frank J. Folding leg support for metal bed. 4,598,434, Cl. 5-200.00R.

Misato, Tomomasa; Homma, Yasuo; Arimoto, Yutaka; Hidaka, Tohoru; and Yuda, Mitsuhara, to Rikagaku Kenkyusho; Riken Vitamin Oil Co., Ltd.; and Hodogaya Chemical Co., Ltd. Agricultural and horticultural fungicide and fruit storage disease preventing agent and process for production thereof. 4,599,233, Cl. 424-127.000.

Misevich, Kenneth W., to Colgate-Palmolive Company. Athletic shoes for sports-oriented activities. 4,598,487, Cl. 36-114.000.

Misra, Raj N., to E. R. Squibb & Sons, Inc. Arachidonic acid analogs. 4,599,439, Cl. 556-443.000.

Mita Industrial Co., Ltd.: *See—*
Kusumoto, Hiroshi; and Uehara, Yoshiyuki, 4,598,990, Cl. 355-3.0FU.

Mitchell, Eugene: *See—*
Vranish, John M.; Mitchell, Eugene; and DeMoyer, Robert, 4,598,595, Cl. 73-862.080.

Mitchell, Kim W.: *See—*
Bender, David L.; and Mitchell, Kim W., 4,599,154, Cl. 204-129.600.

Mitsubishi Chemical Industries, Inc.: *See—*
Kikumoto, Ryoji; Fukami, Harukazu; Hara, Hiroto; Ninomiya, Kunihiro; and Sugano, Mamoru, 4,599,419, Cl. 544-391.000.

Mitsubishi Chemical Industries Ltd.: *See—*
Kuroda, Katsuhiko; and Yamanouchi, Hideki, 4,599,432, Cl. 549-255.000.
Tamaru, Akio; Izumisawa, Yoshiaki; Hashimoto, Hidekichi; Kuma, Kiyoji; Komaya, Takashi; and Minagawa, Masanobu, 4,599,465, Cl. 568-781.000.
Yoshimura, Tamotsu; Nakamura, Masahiko; and Kasai, Atsushi, 4,599,397, Cl. 528-190.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Kamei, Mitsuhito; Nemoto, Shin; and Ishimoto, Souji, 4,598,998, Cl. 356-237.000.

Mitsubishi Jidosha Kogyo K.K.: *See—*
Kumagai, Naotake; Tatemoto, Minoru; Takizawa, Shozo; Takada, Hiroyuki; and Harara, Mitsuhiko, 4,598,929, Cl. 280-707.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Kamisaka, Makoto; Okamoto, Toshiro; Ohshima, Michio; and Tamai, Mamoru, 4,599,478, Cl. 585-648.000.
Okamoto, Toshiro; and Ohshima, Michio, 4,599,479, Cl. 585-648.000.

Mitsubishi-Kasei Technoengineers Ltd.: *See—*
Ando, Masao; and Tanimura, Masatake, 4,599,115, Cl. 127-46.100.

Mitsubishi Paper Mills, Ltd.: *See—*
Tanaka, Akira; Miura, Hidetoshi; and Koga, Masao, 4,599,300, Cl. 430-411.000.

Mitsui Petrochemical Industries, Ltd.: *See—*
Hayashi, Akira; Hirota, Yutaka; and Tanaka, Mitsuhiro, 4,599,275, Cl. 428-461.000.

Mitsui Toatsu Chemicals, Incorporated: *See—*
Kiyoura, Tadamitsu, 4,599,446, Cl. 562-527.000.

Mitsuitoatsu Chemicals, Inc.: *See—*
Nakatani, Kiyoshi; Numata, Satoshi; Inoue, Tsuneo; Hosono, Akira; Oda, Kengo; Kubota, Yutaka; Tachibana, Hajime; Udagawa, Takatoshi; and Gohbara, Masatoshi, 4,599,362, Cl. 514-721.000.

Miura, Hidetoshi: *See—*
Tanaka, Akira; Miura, Hidetoshi; and Koga, Masao, 4,599,300, Cl. 430-411.000.

Miyada, Thomas S. Inertial safety net system. 4,598,931, Cl. 280-749.000.

Miyakawa, Akira: *See—*
Terasawa, Koji; Miyakawa, Akira; and Kiyohara, Takehiko, 4,599,625, Cl. 346-140.00R.

Miyake, Hideyuki: *See—*
Aiba, Masahiko; Kuranishi, Masaaki; and Miyake, Hideyuki, 4,599,624, Cl. 346-75.000.

Miyaki, Masahiko: *See—*
Ohmori, Toshihiko; Sumitani, Sinya; Tani, Takio; Miyaki, Masahiko; and Masuda, Akira, 4,598,683, Cl. 123-450.000.

Miyamura, Masataka: *See—*
Sugiuchi, Masami; Miyamura, Masataka; Imai, Atsuo; and Matake, Shigeru, 4,598,979, Cl. 350-357.000.

Miyamura, Tamio: *See—*
Ueno, Kouji; and Miyamura, Tamio, 4,599,688, Cl. 365-189.000.

Miyano, Hitoshi: *See—*
Doi, Yoshikazu; Miyano, Hitoshi; Kishikawa, Toshiro; and Sunaga, Yasumasa, 4,598,980, Cl. 350-445.000.

Miyano, Takashi; and Miyano, Takashi, to Mikuni Kogyo Kabushiki Kaisha. Method of controlling air-fuel ratio of an engine. 4,598,682, Cl. 123-440.000.

Miyano, Takashi: *See—*
Miyano, Takashi; and Miyano, Takashi, 4,598,682, Cl. 123-440.000.

Miyao, Masanobu; Ohkura, Makoto; Takemoto, Iwao; and Tamura, Masao, to Hitachi, Ltd. Method of producing single-crystal silicon film. 4,599,133, Cl. 156-617.00R.

Miyasaka, Tetsuo: *See—*
Shiratori, Kazutoshi; Kodama, Takashi; Kawazoe, Mitsuo; Miyasaka, Tetsuo; and Nagao, Masaki, 4,598,986, Cl. 354-21.000.

Miyashita, Kunio: *See—*
Takahashi, Tadashi; Miyashita, Kunio; and Hayashida, Hiroshi, 4,599,561, Cl. 324-208.000.

Miyazaki, Yoshifumi: *See—*
Moriki, Etsuzo; Miyazaki, Yoshifumi; and Nonoue, Torahiko, 4,599,545, Cl. 318-314.000.

Miyazawa, Yoshiki: *See—*
Nakamura, Yoshinori; and Miyazawa, Yoshiki, 4,598,831, Cl. 215-1.00C.

Mizuno, Naohito: *See—*
Ito, Novuei; Atsumi, Kinya; Mizuno, Naohito; and Kikuchi, Tetsuro, 4,598,676, Cl. 123-145.00A.

Mizuno, Toshiaki: *See—*
Kato, Katsushi; and Mizuno, Toshiaki, 4,598,684, Cl. 123-478.000.

Mizutani, Morikazu; Onoda, Shigeyoshi; Nomura, Akihiro; Kanemitsu, Shinji; and Toriumi, Mototada, to Canon Kabushiki Kaisha. Process unit and image formation apparatus provided with the process unit. 4,598,993, Cl. 355-3.00R.

Mobil Oil Corporation: *See—*
Holmes, Billy G., 4,598,772, Cl. 166-251.000.
Horodysky, Andrew G.; Kaminski, Joan M.; Ashjian, Henry; and Gawel, Henry A., 4,599,183, Cl. 252-32.70E.
Horodysky, Andrew G., 4,599,191, Cl. 252-32.500.
Kresge, Charles T.; Vartuli, James C.; and Nicoletti, Michael P., 4,599,475, Cl. 585-481.000.
Shu, Winston R.; and Hartman, Kathy J., 4,598,770, Cl. 166-245.000.
Yen, Jeffrey H., 4,599,162, Cl. 208-59.000.

Mochiji, Kozo: *See—*
Kimura, Takeshi; Obayashi, Hidehito; and Mochiji, Kozo, 4,599,737, Cl. 378-35.000.

Modak, Shanta M.: *See—*
Fox, Charles L., Jr.; Modak, Shanta M.; and Fox, Paul, 4,599,226, Cl. 424-27.000.

Modern Home Products Corp.: *See—*
Koziol, Walter, 4,598,693, Cl. 126-41.00R.

Moffat, Arlo J.: *See—*
Scinta, James; and Moffat, Arlo J., 4,599,161, Cl. 201-16.000.

Mokadam, Raghunath G., to Sundstrand Corporation. High efficiency refrigeration or cooling system. 4,598,556, Cl. 62-117.000.

Molaug, Ole. Means for counterbalancing mass in mechanisms such as a robot arm. 4,598,601, Cl. 74-469.000.

Moll, Eberhard; and Buhl, Rainer, to Balzers Aktiengesellschaft. Apparatus for treating the inside surface of an article with an electric glow discharge. 4,598,663, Cl. 118-50.100.

Mondello, Brian C.; and Rosier, Hendrik E., to Huck Manufacturing Company. Apparatus and gripping jaw assembly for setting fasteners. 4,598,572, Cl. 72-391.000.

Mondul, Donald D.: *See—*
Froeb, John W.; and Mondul, Donald D., 4,599,605, Cl. 340-347.00P.

Mongin, Michel; and Jaccod, Michel, to Valeo. Arrangement of auxiliary equipment units for internal combustion engined automotive vehicles. 4,598,677, Cl. 123-195.00A.

Monhardt, Richard J.; Orr, Alfred B.; and Wright, Joseph B., to United Technologies Corporation. Beam for a containment structure. 4,598,449, Cl. 29-157.00R.

Monie, Jean, to Carpano et Pons. Programmer control device. 4,598,607, Cl. 74-568.00T.

Monreal, F. Javier. Long knee-foot boot for skiing/sledding. 4,598,927, Cl. 280-611.000.

Monroe, Thomas D., to RCA Corporation. Dark current eliminator useful for auto-iris controller. 4,599,654, Cl. 358-228.000.

Montedison S.p.A.: *See—*
Berte', Ferruccio; Marciandi, Franco; and Binaghi, Marco, 4,599,375, Cl. 524-100.000.
Bosone, Enrico; Caprara, Giuseppe; Corda, Francesco; Gozzo, Franco; Menconi, Augusto; Piccardi, Paolo; and Caprioli, Vincenzo, 4,599,358, Cl. 514-521.000.

Mooch Domsjo Aktiebolag: *See—*
Lindahl, Jonas A. I., 4,599,138, Cl. 162-19.000.

Moore Business Forms, Inc.: *See*—
Chao, Hung-Ya, 4,599,271, Cl. 428-402.210.
Pennock, Thomas G., 4,598,860, Cl. 229-69.000.
Moore, David G.: *See*—
Foster, Donald D.; Hills, Robert N.; Moore, David G.; and Nelson, Phil L., 4,598,843, Cl. 222-153.000.
Moore, George F., Jr. Method and apparatus for producing an air texturized yarn. 4,598,538, Cl. 57-7.000.
Moorehead, Eric L.: *See*—
Robinson, Paul R.; and Moorehead, Eric L., 4,599,477, Cl. 585-622.000.
Moormann, Randall H.: *See*—
Ventura, Frank D.; and Moormann, Randall H., 4,598,909, Cl. 273-60.00B.
Morgan, Harold W. Weight lifting gym. 4,598,908, Cl. 272-134.000.
Morgan, Thomas K., Jr., to Schering A.G. Quinuclidines and quinuclidinium salts as antiarrhythmic agents. 4,599,344, Cl. 514-305.000.
Mori, Hiromitsu; Akagi, Kosuke; and Kitahata, Hiroki, to Osaka Gas Company Limited. Hot gas generator. 4,598,541, Cl. 60-39.070.
Mori, Keisuke: *See*—
Nishikawa, Kazuo; and Mori, Keisuke, 4,599,739, Cl. 378-39.000.
Mori, Kunio: *See*—
Iwasaki, Yoshitaka; Mori, Kunio; and Tanabe, Yoshio, 4,598,780, Cl. 177-3.000.
Moriki, Etsuzo; Miyazaki, Yoshifumi; and Nonoue, Torahiko, to Sanyo Electric Co., Ltd. Servomotor controller. 4,599,545, Cl. 318-314.000.
Morisaki, Hiroshi: *See*—
Tsunekawa, Sukeyoshi; Homma, Yoshio; Morisaki, Hiroshi; Okudaira, Sadayuki; and Mukai, Kiichiro, 4,599,135, Cl. 156-643.000.
Morita, Haruyuki: *See*—
Nakayama, Masatoshi; Morita, Haruyuki; Tokuoka, Yasumichi; Izumi, Toshiaki; Fukuda, Kazumasa; and Kubota, Yuichi, 4,599,266, Cl. 428-336.000.
Morita, Koichi: *See*—
Ishizaki, Naoki; and Morita, Koichi, 4,599,050, Cl. 417-216.000.
Morlet, Jean P.: *See*—
Goupillaud, Pierre L.; Morlet, Jean P.; and Grossmann, Alexandre, 4,599,567, Cl. 324-77.00G.
Morris, James B. N. Hydril-type connector. 4,598,455, Cl. 29-402.020.
Morris, William. Container and dispenser for material in granular or powder form. 4,598,844, Cl. 222-196.200.
Morrison, Robert A.: *See*—
Frink, Attila; and Morrison, Robert A., 4,598,964, Cl. 339-37.000.
Morsdorf, Peter: *See*—
Schickaneder, Helmut; Postius, Stefan; Herter, Rolf; Morsdorf, Peter; Szelenyi, Istvan; and Ahrens, Kurt H., 4,599,346, Cl. 514-317.000.
Mortimer, Brian C., to Canadian Patents and Development Limited-Societe Canadienne des Brevets et D'Exploitation Limitee. Apparatus for encoding and decoding digital data to permit error correction. 4,599,722, Cl. 371-37.000.
Mostek Corporation: *See*—
Han, Yu-Pin; and Chan, Tsiu C., 4,599,118, Cl. 148-1.500.
Motorola, Inc.: *See*—
Deutsch, Robert, 4,599,695, Cl. 364-431.110.
McKenzie, James A.; and Peterson, Joe W., 4,599,604, Cl. 340-347.0AD.
Mullen, William B., III; and Urbish, Glenn F., 4,598,972, Cl. 339-258.00R.
Reitz, Christopher J.; and Barrus, Jeffery C., 4,598,962, Cl. 339-17.00L.
Sasser, Bill H.; Eckstein, Roger J.; and Engle, Kenneth, 4,599,584, Cl. 333-125.000.
Schultz, Warren J., 4,599,548, Cl. 318-599.000.
Welty, Dennis L., 4,599,494, Cl. 179-84.00T.
Motte, Shunichi: *See*—
Harajiri, Toshihiko; Motte, Shunichi; and Shinbo, Masafumi, 4,599,246, Cl. 427-86.000.
Moulton, Richard J.; and Neuner, John D., to Hexcel Corporation. Perimidene and benzimidazole derivatives useful in curable compositions. 4,599,413, Cl. 544-231.000.
Mourey, Bruno; Hareng, Michel; and Thirant, Lydie, to Thomson CSF. Screen of a display device using a mixed thermal and electrical effect. 4,598,978, Cl. 350-351.000.
Moyes, Gregory R., to Moygro Manufacturing Limited. Alarm check valve. 4,598,734, Cl. 137-515.700.
Moygro Manufacturing Limited: *See*—
Moyes, Gregory R., 4,598,734, Cl. 137-515.700.
Mross, Wolf D.: *See*—
Fischer, Rolf; Hoelderich, Wolfgang; Merger, Franz; Mross, Wolf D.; and Weitz, Hans-Martin, 4,599,458, Cl. 568-450.000.
Mrotz, Walter C., III: *See*—
Franckowiak, Paul F.; and Mrotz, Walter C., III, 4,598,892, Cl. 248-406.200.
MTU Motoren-und Turbinen-Union Muenchen GmbH: *See*—
Thoma, Martin; and Bunger, Paul, 4,599,148, Cl. 204-16.000.
Mudford, Graeme C.; and Mudford, Robyn J. Method of processing unshelled nuts. 4,599,236, Cl. 426-456.000.
Mudford, Robyn J.: *See*—
Mudford, Graeme C.; and Mudford, Robyn J., 4,599,236, Cl. 426-456.000.
Muehlbauer, Heinz A.: *See*—
Lee, Andrew O.; Muehlbauer, Heinz A.; and Blackburn, Keith, 4,599,091, Cl. 44-11.000.
Mueller, Heinz: *See*—
Wuhrmann, Juan C.; Brands, Karl D.; Mueller, Heinz; Schumann, Klaus; and Altenschoepfer, Theodor, 4,599,189, Cl. 252-174.150.
Mueller, Herbert; and Reiss, Wolfgang, to BASF Aktiengesellschaft. Preparation of alkanediols. 4,599,466, Cl. 568-861.000.
Mugnier, Jacques; Jung, Gerard; and Prioul, Jean-Louis, to Rhone-Poulenc Agrochimie. Method of producing endomycorrhizian fungi with arbuscules and vesicles in vitro. 4,599,312, Cl. 435-172.300.
Mukai, Kiichiro: *See*—
Tsunekawa, Sukeyoshi; Homma, Yoshio; Morisaki, Hiroshi; Okudaira, Sadayuki; and Mukai, Kiichiro, 4,599,135, Cl. 156-643.000.
Mukai, Mitsukazu: *See*—
Hayashi, Saburo; Mukai, Mitsukazu; Inoue, Masahiro; Tsuchiya, Hiroo; Otsuji, Akira; and Tanabe, Takeo, 4,599,177, Cl. 210-718.000.
Mullen, C. Thomas: *See*—
Leeper, Lloyd C.; and Mullen, C. Thomas, 4,598,619, Cl. 83-117.000.
Mullen, William B., III; and Urbish, Glenn F., to Motorola, Inc. High density electrical lead. 4,598,972, Cl. 339-258.00R.
Muller, Arthur; and Richle, Walter, to Laboratorien Hausmann AG. Process for the production of iron(III)hydroxide/dextran complexes and a sterile pharmaceutical solution containing them. 4,599,405, Cl. 536-113.000.
Muller, Manfred; and Klausecker, Karl, to Siemens Aktiengesellschaft. Method and apparatus for driving a transistorized polyphase pulse inverter. 4,599,686, Cl. 363-41.000.
Muller, Peter. Controllable pitch propeller and watercraft drive. 4,599,043, Cl. 416-162.000.
Mullin, John B.; Holliday, Arthur K.; Cole-Hamilton, David J.; Jones, Anthony C.; and Gerrard, Neil D., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Preparation of adducts. 4,599,150, Cl. 204-59.0QM.
Mulvaney, Lewis W., to R. Neumann & Co. Partially detackified leather and glove. 4,598,429, Cl. 2-169.000.
Mungin, Halbert: *See*—
Cannady, Daniel L., Jr.; Mungin, Halbert; and Berg, Gilbert G., 4,599,127, Cl. 156-289.000.
Mungovan, John P.: *See*—
Douglas, Robert J.; Doughty, Robert L.; Mungovan, John P.; Andersen, Robert P.; and Abbott, Vaughan, 4,599,101, Cl. 65-164.000.
Munn, Robert D.; and Stilwell, George R., Jr., to International Business Machines Corporation. Optical fiber connector having integral electrodes for use in fusion splicing. 4,598,974, Cl. 350-96.210.
Murakami, Manabu: *See*—
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Nakamoto, Kouji; Kajiwara, Akiharu; Katayama, Kouichi; Tsunoda, Hajime; Murakami, Manabu; Ono, Hideki; and Yamada, Kouji, 4,599,328, Cl. 514-106.000.
Murakami, Shunichi; Ishida, Tetsuo; and Sakai, Junro, to Anelva Corporation. Substrate holder for molecular beam epitaxy apparatus. 4,599,069, Cl. 432-253.000.
Murakami, Yasuo: *See*—
Furumura, Kyozaburo; Sugi, Hiromi; Murakami, Yasuo; and Asai, Hiromitsu, 4,598,914, Cl. 277-80.000.
Murakawa, Tsutomu: *See*—
Ohkumo, Hiroya; and Murakawa, Tsutomu, 4,598,679, Cl. 123-325.000.
Muralidhara, Ranya: *See*—
Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,599,237, Cl. 426-535.000.
Muramatsu, Hiroshi, to Victor Company of Japan, Limited. Mechanism for driving capstans in tape recorders. 4,599,661, Cl. 360-96.200.
Murase, Ichiki; Ohnishi, Toshihiro; and Noguchi, Takanobu, to Director-General of the Agency of Industrial Science and Technology, an Organ of the Ministry of International Trade and Industry of Japan. Highly electroconductive pyroiyzed product retaining its original shape and composition formed therefrom. 4,599,193, Cl. 252-511.000.
Murata, Katuyoshi: *See*—
Maruyama, Yutaka; Negishi, Junji; Murata, Katuyoshi; and Katsuhara, Yutaka, 4,599,455, Cl. 568-411.000.
Murata Kikai Kabushiki Kaisha: *See*—
Uchida, Hiroshi; and Kawarabashi, Tsukasa, 4,598,869, Cl. 242-35.50A.
Murayama, Satoshi: *See*—
Irikura, Tsutomu; Murayama, Satoshi; and Iinuma, Fjuio, 4,599,418, Cl. 544-361.000.
Murphy, Robert H. Spring for tubular IC carriers. 4,598,820, Cl. 206-328.000.
Murray, Donald F., to Tektronix, Inc. Programmable cross bar multiplexer. 4,599,721, Cl. 370-112.000.
Murray, Rex E.: *See*—
Billig, Ernst; Abatjoglou, Anthony G.; Bryant, David R.; Murray, Rex E.; Mather, John M.; and Hsu, Song K., 4,599,059, Cl. 418-236.000.
Billig, Ernst; Abatjoglou, Anthony G.; Bryant, David R.; Murray, Rex E.; and Mather, John M., 4,599,206, Cl. 558-85.000.
Mutoh, Nobuyoshi; Sakai, Keijiro; Ueda, Akiteru; Ishibashi, Akira; and Okajima, Ikuo, to Hitachi, Ltd. Method and apparatus for controlling PWM inverters. 4,599,549, Cl. 318-798.000.

Mutschelknaus, Rolf: *See—*
Otto, Eberhard; Mutschelknaus, Rolf; and Hauptmann, Andreas, 4,598,633, Cl. 98-115.200.
Nagafuchi, Eiichi: *See—*
Manabe, Masahiro; Nagafuchi, Eiichi; and Nohara, Yoshio, 4,599,061, Cl. 425-41.000.
Nagai, Kazutoshi; Aoyagi, Hirofumi; Nasu, Ichiro; and Watanabe, Shinichi, to Matsushita Electric Industrial Co., Ltd. Sanitary cleaning apparatus. 4,598,431, Cl. 4-420.200.
Nagai, Masaru: *See—*
Yamada, Minoru; Ito, Eiji; and Nagai, Masaru, 4,598,989, Cl. 354-400.000.
Nagano, Eiki; and Yoshida, Ryo, to Sumitomo Chemical Company, Limited. Herbicidal pyridotriazolium compounds. 4,599,104, Cl. 71-92.000.
Nagao, Masaki: *See—*
Shiratori, Kazutoshi; Kodama, Takashi; Kawazoe, Mitsuo; Miyasaka, Tetsuo; and Nagao, Masaki, 4,598,986, Cl. 354-21.000.
Nagata, Minoru: *See—*
Yoshida, Isao; Okabe, Takeaki; Ochi, Shikayuki; Ito, Hidefumi; Furumi, Masatomo; Takeuchi, Masaru; and Nagata, Minoru, 4,599,576, Cl. 330-264.000.
Nagy nee Koranyi, Livia: *See—*
Gonczi, Csaba; Korbonits, Dezso ; Palosi, Endre; Kiss, Pal; Heja, Gergely; Kun, Judit; Szomor nee Wundele, Maria; Szvoboda nee Kanzel, Ida; Marvanyos, Ede; Horvath, Karoly; Kovacs nee Mindler, Vera; and Nagy nee Koranyi, Livia, 4,599,428, Cl. 548-306.000.
Naito, Mitikatu; Yano, Kiyotosi; Itou, Kazuo; Tsuzuki, Kunihiro; Tanaka, Masaaki; and Kawagoe, Michio, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Negative pressure control valve. 4,598,729, Cl. 137-116.500.
Nakaboh, Hiroshi; and Ogura, Ken, to Oki Electric Industry Co., Ltd. Method for inspecting defects of thin material film. 4,599,241, Cl. 427-8.000.
Nakagawa, Shiro; Kuroiwa, Akihiko; and Nanba, Kenryo, to TDK Electronics Co., Ltd. Method for erasing a light recording medium. 4,599,718, Cl. 369-100.000.
Nakai, Yoshiharu: *See—*
Kamiya, Takashi; Tanaka, Kunihiko; Teraji, Tsutomu; and Nakai, Yoshiharu, 4,599,426, Cl. 548-195.000.
Nakama, Taihei: *See—*
Furuhata, Takashi; Nakama, Taihei; Abe, Yuuhei; and Satoh, Kenji, 4,599,569, Cl. 328-111.000.
Nakamoto, Kouji: *See—*
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Nakamoto, Kouji; Kajiwara, Akiharu; Katayama, Kouichi; Tsunoda, Hajime; Murakami, Manabu; Ono, Hideki; and Yamada, Kouji, 4,599,328, Cl. 514-106.000.
Nakamura, Akira; Asao, Shunji; and Ito, Yoshiyuki, to Caterpillar Mitsubishi Ltd. Flow control valve. 4,598,730, Cl. 137-117.000.
Nakamura, Keiichi: *See—*
Numazawa, Akio; Nakamura, Keiichi; and Sakai, Toshifumi, 4,599,051, Cl. 417-293.000.
Nakamura, Masahiko: *See—*
Yoshimura, Tamotsu; Nakamura, Masahiko; and Kasai, Atsushi, 4,599,397, Cl. 528-190.000.
Nakamura, Michiharu: *See—*
Sasaki, Yoshimitsu; Kajimura, Takashi; Chinone, Naoki; and Nakamura, Michiharu, 4,599,729, Cl. 372-49.000.
Nakamura Purosesu Kogei Kabushiki Kaisha: *See—*
Nakamura, Samuro, 4,599,122, Cl. 156-64.000.
Nakamura, Samuro, to Nakamura Purosesu Kogei Kabushiki Kaisha. Method of taping separation films for photoengraving and apparatus therefor. 4,599,122, Cl. 156-64.000.
Nakamura, Yoshinori; and Miyazawa, Yoshiki, to Nissei ASB Machine Co., Ltd. Heat-resistant synthetic resin bottle. 4,598,831, Cl. 215-1.00C.
Nakanishi, Tosaku: *See—*
Fukuma, Yoshitaka; and Nakanishi, Tosaku, 4,599,613, Cl. 340-784.000.
Nakanishi, Yutaka: *See—*
Ando, Toshihiro; Nakanishi, Yutaka; and Ukita, Kenkichi, 4,599,274, Cl. 428-442.000.
Nakatani, Isao; and Masumoto, Katashi. Process for producing ferromagnetic liquid. 4,599,184, Cl. 252-62.510.
Nakatani, Kiyoshi; Numata, Satoshi; Inoue, Tsuneo; Hosono, Akira; Oda, Kengo; Kubota, Yutaka; Tachibana, Hajime; Udagawa, Takatoshi; and Gohbara, Masatoshi, to Mitsuitoatsu Chemicals, Inc. 2-arylethyl ether derivatives and insecticidal and acaricidal agents containing said derivatives. 4,599,362, Cl. 514-721.000.
Nakayama, Kazuaki, to Pioneer Electronic Corporation. Voltage adder circuit. 4,599,572, Cl. 330-69.000.
Nakayama, Masatoshi; Morita, Haruyuki; Tokuoka, Yasumichi; Izumi, Toshiaki; Fukuda, Kazumasa; and Kubota, Yuichi, to TDK Corporation. Magnetic recording medium. 4,599,266, Cl. 428-336.000.
Nanba, Kenryo: *See—*
Nakagawa, Shiro; Kuroiwa, Akihiko; and Nanba, Kenryo, 4,599,718, Cl. 369-100.000.
Nankai Tekko Co., Ltd.: *See—*
Tomozawa, Shigeo, 4,598,805, Cl. 192-6.00R.
Nappe Babcock Co.: *See—*
Rabinowitz, Harold, 4,598,746, Cl. 150-52.00R.
Narayanan, Venkatachala L.; Wolpert-Defilippes, Mary K.; and Haugwitz, Rudiger D., to United States of America, Health and Human Services. Antineoplastic platinum (IV) complexes and compositions. 4,599,352, Cl. 514-492.000.
Nashef, Aws S., to American Hospital Supply Corp. Method of using biological tissue to promote even bone growth. 4,599,084, Cl. 623-16.000.
Nason, William C.: *See—*
Carson, Matthew; Le Mahieu, Ronald A.; Nason, William C.; and Tilley, Jefferson W., 4,599,336, Cl. 514-259.000.
Nasu, Ichiro: *See—*
Nagai, Kazutoshi; Aoyagi, Hirofumi; Nasu, Ichiro; and Watanabe, Shinichi, 4,598,431, Cl. 4-420.200.
National Bullet Proof, Inc.: *See—*
Biedess, Frederick F., 4,598,647, Cl. 109-77.000.
National Forge Company: *See—*
Khare, Ashok; and Duliba, Paul, 4,599,502, Cl. 219-8.500.
National Semiconductor Corporation: *See—*
Culmer, Daniel D.; and Cometta, Robert A., 4,599,634, Cl. 357-40.000.
National Technical Systems: *See—*
Goldsmith, Alfred D.; and Fleishman, Roc V., 4,598,576, Cl. 73-19.000.
Nava, Pier L. Integral helmet, in particular for sports use. 4,598,430, Cl. 2-410.000.
Nawata, Kazumasa: *See—*
Kanai, Yasunori; Sugiyama, Eiji; and Nawata, Kazumasa, 4,599,521, Cl. 307-455.000.
Nawrath, Nikolaus, to M.A.N. Roland Druckmaschinen Aktiengesellschaft. Printing unit for a web-fed offset rotary press. 4,598,640, Cl. 101-177.000.
NCR Canada Ltd-NCR Canada LTEE: *See—*
Ho, Benedict C. M., 4,599,547, Cl. 318-594.000.
NEC Corporation: *See—*
Fujii, Akira; Tokunaga, Tadatsugu; and Adachi, Hiroaki, 4,599,648, Cl. 358-124.000.
Yamamoto, Kazuhiro, 4,599,734, Cl. 375-40.000.
Neff Instrument Corporation: *See—*
Chambers, William R., 4,599,574, Cl. 330-254.000.
Negishi, Junji: *See—*
Maruyama, Yutaka; Negishi, Junji; Murata, Katuyoshi; and Katsuhara, Yutaka, 4,599,455, Cl. 568-411.000.
Neiss, Melvin A.; and Woodruff, Robert W., to Du Pont de Nemours, E. I., and Company. Process for preparing overcoated photohardenable element having surface protuberances. 4,599,299, Cl. 430-273.000.
Nellums, Richard A.; Braun, Eugene R.; and Holtzhauser, Joseph C., to Eaton Corporation. Positive drive. 4,598,609, Cl. 74-650.000.
Nelson, Phil L.: *See—*
Foster, Donald D.; Hills, Robert N.; Moore, David G.; and Nelson, Phil L., 4,598,843, Cl. 222-153.000.
Nelson, Stanford C. Pilferage deterrent device for lading, carrying vehicles, such as boxcars and the like. 4,598,941, Cl. 292-134.000.
Nemecek, Oldrich: *See—*
Fisnerova, Ludmila; Grimova, Jaroslava; Roubal, Zdenek; and Nemecek, Oldrich, 4,599,415, Cl. 544-284.000.
Nemoto, Shin: *See—*
Kamei, Mitsuhito; Nemoto, Shin; and Ishimoto, Souji, 4,598,998, Cl. 356-237.000.
Neodontics, Inc.: *See—*
Riess, Guido; and Geiger, Albert, 4,599,085, Cl. 623-16.000.
Neubuser, Siegmar; Dose, Peter; and Herrig, Friedhelm, to E. C. H. Will (GmbH & Co.). Method of accumulating stacks of paper sheets or the like. 4,599,039, Cl. 414-786.000.
Neuhaus, Harald: *See—*
Lenk, Rainer; Neuhaus, Harald; and Warner, Jurgen, 4,598,760, Cl. 164-158.000.
Neuner, John D.: *See—*
Moulton, Richard J.; and Neuner, John D., 4,599,413, Cl. 544-231.000.
Nevels, David L.; and Baugh, John L., to Hughes Tool Company. Setting tool with retractable torque fingers. 4,598,774, Cl. 166-382.000.
NGK Insulators, Ltd.: *See—*
Ikushima, Kazuo; Itoh, Yoshio; and Ishihara, Toshiaki, 4,599,119, Cl. 148-411.000.
Nguyen, Vietson M.: *See—*
Phillips, Graham R.; and Nguyen, Vietson M., 4,599,552, Cl. 322-28.000.
Nhy-temp, Inc.: *See—*
Windecker, Robert J., 4,598,555, Cl. 62-91.000.
Nicholas, Richard W.: *See—*
McMahan, David R.; and Nicholas, Richard W., 4,599,681, Cl. 362-80.000.
Nichols, Cynthia L.; and Kornfeld, Edmund C., to Eli Lilly and Company. Use of pyrimido[4,5-g]quinolines in treating parkinsonism. 4,599,339, Cl. 514-267.000.
Nicole, Pierre: *See—*
Beaudet, Didier M.; and Nicole, Pierre, 4,599,527, Cl. 307-310.000.
Nicoletti, Michael P.: *See—*
Kresge, Charles T.; Vartuli, James C.; and Nicoletti, Michael P., 4,599,475, Cl. 585-481.000.
Niggemann, Richard E., to Sundstrand Corporation. Solar boiler or energy storage apparatus. 4,598,695, Cl. 126-433.000.
Nilsen, Frank C.: *See—*
Chan, Fred N.; and Nilsen, Frank C., 4,599,697, Cl. 364-434.000.

Ninomiya, Kunihiro: *See*—
Kikumoto, Ryoji; Fukami, Harukazu; Hara, Hiroto; Ninomiya, Kunihiro; and Sugano, Mamoru, 4,599,419, Cl. 544-391.000.
Nippon Electric Co., Ltd.: *See*—
Umetsu, Shinjiro, 4,599,615, Cl. 340-825.440.
Nippon Notion Kogyo Co., Ltd.: *See*—
Yoshieda, Keiichi, 4,598,468, Cl. 29-716.000.
Nippon Petrochemicals Company, Limited: *See*—
Yamamoto, Kaoru; Inoue, Takashi; Kojima, Shinji; and Nishimura, Sadahiro, 4,599,391, Cl. 526-282.000.
Nippon Seiko K.K.: *See*—
Furumura, Kyozaburo; Sugi, Hiromi; Murakami, Yasuo; and Asai, Hiromitsu, 4,598,914, Cl. 277-80.000.
Nippon Soken, Inc.: *See*—
Ito, Novuei; Atsumi, Kinya; Mizuno, Naohito; and Kikuchi, Tetsuro, 4,598,676, Cl. 123-145.00A.
Nippon Telegraph and Telephone Corp.: *See*—
Akiya, Hideo, 4,599,137, Cl. 156-643.000.
Nippon Zeon Co., Ltd.: *See*—
Ohsumi, Yoshinori; and Sato, Takanori, 4,599,309, Cl. 435-68.000.
Nippondenso Co., Ltd.: *See*—
Kato, Katsushi; and Mizuno, Toshiaki, 4,598,684, Cl. 123-478.000.
Naito, Mitikatu; Yano, Kiyotosi; Itou, Kazuo; Tsuzuki, Kunihiro; Tanaka, Masaaki; and Kawagoe, Michio, 4,598,729, Cl. 137-116.500.
Ohmori, Toshihiko; Sumitani, Sinya; Tani, Takio; Miyaki, Masahiko; and Masuda, Akira, 4,598,683, Cl. 123-450.000.
Uemura, Keiichi, 4,599,546, Cl. 318-443.000.
Nishikawa, Kazuo; and Mori, Keisuke, to Kabushiki Kaisha Morita Seisakusho. Dental radiographic apparatus for photographing entire jaws. 4,599,739, Cl. 378-39.000.
Nishimura, Nobuo: *See*—
Saitoh, Koichi; Itami, Teruhiko; Kimoto, Toshifumi; and Nishimura, Nobuo, 4,599,658, Cl. 360-59.000.
Nishimura, Sadahiro: *See*—
Yamamoto, Kaoru; Inoue, Takashi; Kojima, Shinji; and Nishimura, Sadahiro, 4,599,391, Cl. 526-282.000.
Nissan Motor Co., Ltd.: *See*—
Hayashi, Yoshimasa, 4,598,681, Cl. 123-425.000.
Hayashi, Yoshimasa, 4,598,687, Cl. 123-563.000.
Ideta, Yasufumi, 4,598,612, Cl. 74-867.000.
Kurata, Hidenori; and Takahara, Michiyoshi, 4,598,602, Cl. 74-484.00R.
Nissei ASB Machine Co., Ltd.: *See*—
Nakamura, Yoshinori; and Miyazawa, Yoshiki, 4,598,831, Cl. 215-1.00C.
Nitta, Yoshihiko: *See*—
Kaji, Hiroyuki; and Nitta, Yoshihiko, 4,599,612, Cl. 340-723.000.
Nixdorf Computer AG: *See*—
Johannes, Haftmann, 4,598,894, Cl. 248-615.000.
Noack, Rainer: *See*—
Hugo, Peter; and Noack, Rainer, 4,599,425, Cl. 548-142.000.
Nobel, Fred I.; Ostrow, Barnet; and Schram, David N., to LeaRonal, Inc. Process for electroplating tin, lead and tin-lead alloys and baths therefor. 4,599,149, Cl. 204-44.400.
Noble, Sid, to Arco Industries, Ltd. Toy cap gun. 4,598,491, Cl. 42-58.000.
Nogawa, Atsuhiko: *See*—
Kanno, Michio; and Nogawa, Atsuhiko, 4,598,733, Cl. 137-406.000.
Nogradi, Mihaly; Korbonits, Dezso ; Gottsegen, Agnes; Antus, Sandor; Furst, Zsuzsa; Knoll, Jozsef; Szejtli, Jozsef; Stadler, Agnes; Kovacs, Gabor; and Marmarosi, Katalin, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT. Dibenzo[bd]pyran derivatives, process for the preparation thereof and pharmaceutical compositions containing same. 4,599,327, Cl. 514-58.000.
Noguchi, Kiyoshi: *See*—
Izumi, Toshiaki; Noguchi, Kiyoshi; and Kohmoto, Misao, 4,599,280, Cl. 428-694.000.
Noguchi, Takanobu: *See*—
Murase, Ichiki; Ohnishi, Toshihiro; and Noguchi, Takanobu, 4,599,193, Cl. 252-511.000.
Nohara, Yoshio: *See*—
Manabe, Masahiro; Nagafuchi, Eiichi; and Nohara, Yoshio, 4,599,061, Cl. 425-41.000.
Nohl, Alvin L., Jr.: *See*—
Nohl, Arthur H.; Nohl, DeWayne A.; and Nohl, Alvin L., Jr., 4,598,506, Cl. 52-66.000.
Nohl, Arthur H.; Nohl, DeWayne A.; and Nohl, Alvin L., Jr. Swimming pool cover. 4,598,506, Cl. 52-66.000.
Nohl, DeWayne A.: *See*—
Nohl, Arthur H.; Nohl, DeWayne A.; and Nohl, Alvin L., Jr., 4,598,506, Cl. 52-66.000.
Nold, Peter: *See*—
Meyer, Bruno; and Nold, Peter, 4,598,944, Cl. 297-183.000.
Nollet, Michel, to Thomson CSF. Transistorized amplification stage with improved polarization device. 4,599,577, Cl. 330-290.000.
Nomori, Hiroyuki: *See*—
Fujimaki, Yoshihide; Takei, Yoshiaki; Suzuki, Yasuo; and Nomori, Hiroyuki, 4,599,287, Cl. 430-59.000.
Nomura, Akihiro: *See*—
Mizutani, Morikazu; Onoda, Shigeyoshi; Nomura, Akihiro; Kanemitsu, Shinji; and Toriumi, Mototada, 4,598,993, Cl. 355-3.00R.
Nono, Yasushi; and Sasaki, Yoshio, to Toyota Jidosha Kabushiki Kaisha. Rocker arm spring for a valve actuating mechanism of an internal combustion engine. 4,598,674, Cl. 123-90.410.
Nonoue, Torahiko: *See*—
Moriki, Etsuzo; Miyazaki, Yoshifumi; and Nonoue, Torahiko, 4,599,545, Cl. 318-314.000.
Nordmark, Bo Carl G.: *See*—
Liljekvist, Bernt S.; Nordmark, Bo Carl G.; and Tukala, Tommy S., 4,598,779, Cl. 175-410.000.
Nordson Corporation: *See*—
Hartle, Ronald J., 4,598,871, Cl. 239-706.000.
Hollingsworth, Alexander; and Jones, Stephen H., 4,598,527, Cl. 53-427.000.
Smiles, Harry, 4,598,841, Cl. 222-146.500.
North American Agricultural, Inc.: *See*—
Carroll, Michael W.; and Harwood, Michael E., 4,598,569, Cl. 72-325.000.
Northern Telecom Limited: *See*—
Richards, Robert D., 4,599,495, Cl. 179-84.0VF.
Northrop Corporation: *See*—
Danielson, Michael S., 4,598,586, Cl. 73-517.00B.
Nosaki, Takefumi: *See*—
Hosoya, Masahiro; Uehara, Tsutomu; and Nosaki, Takefumi, 4,598,991, Cl. 355-3.0DD.
Novation, Inc.: *See*—
Serrano, Arthur L., 4,599,491, Cl. 179-2.00C.
Nowicki, Roman M.: *See*—
Yen, Chia-Ming; Cole, Gerald S.; and Nowicki, Roman M., 4,598,754, Cl. 164-4.100.
Nowlin, Duane D.; and Walton, Raymond C., to Ecodyne Corporation. Chemical feed pump flow indicator. 4,599,047, Cl. 417-63.000.
Nozawa, Takamitsu: *See*—
Hamaguchi, Masami; Taguchi, Toshio; Nozawa, Takamitsu; and Ogawa, Riichi, 4,598,865, Cl. 239-342.000.
NSK Torrington Company, Ltd.: *See*—
Shibayama, Kiyomi, 4,598,957, Cl. 384-51.000.
NSK-Warner K.K.: *See*—
Ono, Katsuyasu, 4,598,951, Cl. 297-483.000.
NTN-Rulon Industries Co., Ltd.: *See*—
Satoji, Fuminori, 4,599,383, Cl. 525-180.000.
Numata, Satoshi: *See*—
Nakatani, Kiyoshi; Numata, Satoshi; Inoue, Tsuneo; Hosono, Akira; Oda, Kengo; Kubota, Yutaka; Tachibana, Hajime; Udagawa, Takatoshi; and Gohbara, Masatoshi, 4,599,362, Cl. 514-721.000.
Numazawa, Akio; Nakamura, Keiichi; and Sakai, Toshifumi, to Toyota Jidosha Kabushiki Kaisha. Vane type rotary pump. 4,599,051, Cl. 417-293.000.
Numazawa, Masaaki; and Tashiro, Hidetaka, to Senko Medical Instrument Mfg. Co., Ltd. Blood pump apparatus. 4,598,697, Cl. 128-1.00D.
Nutt, Charles O., to Wozniak, Thomas. Method of forming a metal fiberglass interface. 4,599,257, Cl. 428-131.000.
Nygard, Arne: *See*—
Bergman, Carl; Holmstrom, Goran; and Nygard, Arne, 4,598,573, Cl. 72-455.000.
Nygard, Holger B. Survival suit. 4,599,075, Cl. 441-103.000.
Nyland, Lloyd A.; and Klompmaker, Berend, to Ex-Cell-O Corporation. Motor controlled tie bar system for die-casting machine. 4,598,758, Cl. 164-154.000.
O-M Limited: *See*—
Tada, Akira; and Tanigawa, Koichi, 4,599,080, Cl. 493-267.000.
Obara, Hiroyuki, to Takara Co., Ltd. Transformable toy assembly. 4,599,078, Cl. 446-95.000.
Obayashi, Hidehito: *See*—
Kimura, Takeshi; Obayashi, Hidehito; and Mochiji, Kozo, 4,599,737, Cl. 378-35.000.
O'Brien, Edward R.: *See*—
Kremer, Frederic B.; and O'Brien, Edward R., 4,598,714, Cl. 128-660.000.
O'Brien, William; and Pozulp, Kevin. Retrieving device for snagged fishing apparatus. 4,598,493, Cl. 43-17.200.
Ochi, Shikayuki: *See*—
Yoshida, Isao; Okabe, Takeaki; Ochi, Shikayuki; Ito, Hidefumi; Furumi, Masatomo; Takeuchi, Masaru; and Nagata, Minoru, 4,599,576, Cl. 330-264.000.
O'Connor, Donald E., to O'Connor, Johnel M. Two component cartridge case and method of assembly. 4,598,445, Cl. 29-1.300.
O'Connor, Johnel M.: *See*—
O'Connor, Donald E., 4,598,445, Cl. 29-1.300.
Oda, Kengo: *See*—
Nakatani, Kiyoshi; Numata, Satoshi; Inoue, Tsuneo; Hosono, Akira; Oda, Kengo; Kubota, Yutaka; Tachibana, Hajime; Udagawa, Takatoshi; and Gohbara, Masatoshi, 4,599,362, Cl. 514-721.000.
Odle, Roy R., to General Electric Company. Destruction of DNPI in an all nitric acid nitration process. 4,599,429, Cl. 548-481.000.
Oeckl, Siegfried; Schmitt, Hans-Georg; Paulus, Wilfried; and Genth, Hermann, to Bayer Aktiengesellschaft. Microbicidal azolylmethylamines. 4,599,427, Cl. 548-262.000.
Oefinger, Richard W., to USM Corporation. Control valve for a mandrel collection system. 4,598,571, Cl. 72-391.000.
Ofenloch, Bernard G. F. Circular coil electrolysis apparatus. 4,599,158, Cl. 204-228.000.
Officine Gaudino di P. Gaudino & C. S. a.s.: *See*—
Gaudino, Piero, 4,598,540, Cl. 57-278.000.
Ogawa, Riichi: *See*—
Hamaguchi, Masami; Taguchi, Toshio; Nozawa, Takamitsu; and Ogawa, Riichi, 4,598,865, Cl. 239-342.000.

Ogawa, Shinya: *See*—
Yazaki, Yoshio; and Ogawa, Shinya, 4,599,297, Cl. 430-256.000.
Ogawa, Tadashi: *See*—
Ohashi, Yuichi; and Ogawa, Tadashi, 4,599,301, Cl. 430-505.000.
Ogawa, Yasunori: *See*—
Shimozono, Ryoji; Ogawa, Yasunori; Tanaka, Yasuo; and Sano, Shigeo, 4,599,583, Cl. 332-9.00R.
Ogiue, Katsumi: *See*—
Itoh, Kazuo; Ogiue, Katsumi; and Hayasaka, Akio, 4,599,635, Cl. 357-44.000.
Ogura, Ken: *See*—
Nakaboh, Hiroshi; and Ogura, Ken, 4,599,241, Cl. 427-8.000.
Ohashi, Hiroyuki: *See*—
Kawakami, Kiyoshi; Ohashi, Hiroyuki, and Katsumata, Tsutomu, 4,599,145, Cl. 203-71.000.
Ohashi, Yuichi; and Ogawa, Tadashi, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 4,599,301, Cl. 430-505.000.
Ohkawa, Masaki: *See*—
Saitoh, Hiroshi; Kadooka, Katsuyuki; Tsukamoto, Mamoru; Ono, Shoji; and Ohkawa, Masaki, 4,599,238, Cl. 426-557.000.
Ohki, Takanosuke, to Kokan Kako Co., Ltd. Method of producing a rack from pipe material and a rack thus produced. 4,598,451, Cl. 29-159.200.
Ohkumo, Hiroya; and Murakawa, Tsutomu, to Fuji Jukogyo Kabushiki Kaisha. Fuel control system for a vehicle powered by an engine. 4,598,679, Cl. 123-325.000.
Ohkura, Makoto: *See*—
Miyao, Masanobu; Ohkura, Makoto; Takemoto, Iwao; and Tamura, Masao, 4,599,133, Cl. 156-617.00R.
Ohmori, Takashi: *See*—
Saito, Isao; Ishibashi, Yoji; Ohmori, Takashi; Minakawa, Yoshimitsu; and Kuroda, Michio, 4,598,553, Cl. 60-733.000.
Ohmori, Toshihiko; Sumitani, Sinya; Tani, Takio; Miyaki, Masahiko; and Masuda, Akira, to Nippondenso Co., Ltd. Fuel injection pump of the distribution type. 4,598,683, Cl. 123-450.000.
Ohmuro, Yuzo: *See*—
Kambara, Jun; Ohmuro, Yuzo; and Kamogawa, Nin-ichi, 4,599,292, Cl. 430-122.000.
Ohnishi, Toshihiro: *See*—
Murase, Ichiki; Ohnishi, Toshihiro; and Noguchi, Takanobu, 4,599,193, Cl. 252-511.000.
Ohshima, Michio: *See*—
Kamisaka, Makoto; Okamoto, Toshiro; Ohshima, Michio; and Tamai, Mamoru, 4,599,478, Cl. 585-648.000.
Okamoto, Toshiro; and Ohshima, Michio, 4,599,479, Cl. 585-648.000.
Ohsumi, Yoshinori; and Sato, Takanori, to Nippon Zeon Co., Ltd. Post cultivation treatment of yeast cells to facilitate product recovery. 4,599,309, Cl. 435-68.000.
Ohtaki, Kazumi; and Sakamoto, Hiroshi, to Ricoh Company, Ltd. Two-color thermosensitive recording material. 4,599,630, Cl. 346-204.000.
Ohuchi, Rikio: *See*—
Yasuda, Kikuo; Takezaki, Takayuki; Ohuchi, Rikio; Ohuyabu, Hiroshi; Tanimoto, Yoshitaka; Seki, Toshimi; Yamaguchi, Takashi; Izumi, Akihiro; Himori, Norio; and Ishimori, Tsutomu, 4,599,333, Cl. 514-247.000.
Ohuyabu, Hiroshi: *See*—
Yasuda, Kikuo; Takezaki, Takayuki; Ohuchi, Rikio; Ohuyabu, Hiroshi; Tanimoto, Yoshitaka; Seki, Toshimi; Yamaguchi, Takashi; Izumi, Akihiro; Himori, Norio; and Ishimori, Tsutomu, 4,599,333, Cl. 514-247.000.
Oinonen, Hannu, to Oy Wartsila AB. Apparatus for winding web material on a tubular core. 4,598,877, Cl. 242-66.000.
Okabe, Takeaki: *See*—
Yoshida, Isao; Okabe, Takeaki; Ochi, Shikayuki; Ito, Hidefumi; Furumi, Masatomo; Takeuchi, Masaru; and Nagata, Minoru, 4,599,576, Cl. 330-264.000.
Okajima, Ikuo: *See*—
Mutoh, Nobuyoshi; Sakai, Keijiro; Ueda, Akiteru; Ishibashi, Akira; and Okajima, Ikuo, 4,599,549, Cl. 318-798.000.
Okamoto, Ichiro: *See*—
Toga, Yuzo; Okamoto, Ichiro; and Kanno, Tatsuya, 4,599,460, Cl. 568-617.000.
Okamoto, Takeshi; and Minagawa, Shoichi, to Clarion Co., Ltd. Surface acoustic wave device with anti-reflection electrode structure. 4,599,532, Cl. 310-313.00D.
Okamoto, Toshiro; and Ohshima, Michio, to Mitsubishi Jukogyo Kabushiki Kaisha. Thermal cracking process for producing olefins from hydrocarbons. 4,599,479, Cl. 585-648.000.
Okamoto, Toshiro: *See*—
Kamisaka, Makoto; Okamoto, Toshiro; Ohshima, Michio; and Tamai, Mamoru, 4,599,478, Cl. 585-648.000.
Okazaki, Sakiho: *See*—
Kawamura, Yoshikazu; Hosokawa, Minoru; Okazaki, Sakiho; and Ishii, Hiroshi, 4,599,005, Cl. 368-157.000.
Oki Electric Industry Co., Ltd.: *See*—
Nakaboh, Hiroshi; and Ogura, Ken, 4,599,241, Cl. 427-8.000.
Okudaira, Sadayuki: *See*—
Tsunekawa, Sukeyoshi; Homma, Yoshio; Morisaki, Hiroshi; Okudaira, Sadayuki; and Mukai, Kiichiro, 4,599,135, Cl. 156-643.000.
Olesen, Paul, to Swingline Inc. Fastener driving tool including fastener deformation and guidance arrangements. 4,598,852, Cl. 227-119.000.
Olin Corporation: *See*—
Wojtowicz, John A., 4,599,411, Cl. 544-190.000.
Olivieri, Icaro, to Warrington Inc. Protective sole assembly. 4,598,486, Cl. 36-96.000.
Olsen, Linda J.: *See*—
Bowker, Roger S.; Olsen, Linda J.; and Hines, Jesse M., 4,599,611, Cl. 340-721.000.
Olson, Allan H.: *See*—
Carlson, Dana P.; Kerbow, Dewey L.; Leck, Thomas J.; and Olson, Allan H., 4,599,386, Cl. 525-326.200.
Olyha, Robert S., Jr.: *See*—
Castellano, Anthony J., Jr.; DiStefano, Thomas H.; and Olyha, Robert S., Jr., 4,599,558, Cl. 324-158.00R.
Olympus Optical Company Limited: *See*—
Ichikawa, Hajime, 4,599,272, Cl. 428-412.000.
Inoue, Akira, 4,598,985, Cl. 354-21.000.
Kimura, Kenji; and Ida, Masatoshi, 4,599,653, Cl. 358-224.000.
Shiratori, Kazutoshi; Kodama, Takashi; Kawazoe, Mitsuo; Miyasaka, Tetsuo; and Nagao, Masaki, 4,598,986, Cl. 354-21.000.
O'Neil, Edward F.: *See*—
Gabric, John A.; and O'Neil, Edward F., 4,599,520, Cl. 307-578.000.
Ono, Hideki: *See*—
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Nakamoto, Kouji; Kajiwara, Akiharu; Katayama, Kouichi; Tsunoda, Hajime; Murakami, Manabu; Ono, Hideki; and Yamada, Kouji, 4,599,328, Cl. 514-106.000.
Ono, Katsuyasu, to NSK-Warner K.K. Adjustable anchor mounting device. 4,598,951, Cl. 297-483.000.
Ono, Satoshi: *See*—
Hiramitsu, Tetsushi; Sugita, Hiroshi; and Ono, Satoshi, 4,598,603, Cl. 74-484.00R.
Ono, Shoji: *See*—
Saitoh, Hiroshi; Kadooka, Katsuyuki; Tsukamoto, Mamoru; Ono, Shoji; and Ohkawa, Masaki, 4,599,238, Cl. 426-557.000.
Ono, Taizo: *See*—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; and Suyama, Tadakazu, 4,599,343, Cl. 514-299.000.
Onoda, Shigeyoshi: *See*—
Mizutani, Morikazu; Onoda, Shigeyoshi; Nomura, Akihiro; Kanemitsu, Shinji; and Toriumi, Mototada, 4,598,993, Cl. 355-3.00R.
Opalka, Chester J., Jr.: *See*—
Lesher, George Y.; Opalka, Chester J., Jr.; Page, Donald F.; and McGarry, Ruthann M., 4,599,423, Cl. 546-300.000.
Opdahl, Everett W., to Westinghouse Electric Corp. Low profile deployment/retrieval system. 4,598,882, Cl. 244-1.0TD.
Oppermann, Gunter: *See*—
Schiebelhuth, Heinz; Franke, Wolfgang; Kahlcke, Hartwig; and Oppermann, Gunter, 4,599,003, Cl. 366-241.000.
Optical Storage International - U.S.: *See*—
Bracht, Rodger R.; and Verboom, Johannes J., 4,599,717, Cl. 369-54.000.
ORC Manufacturing Co., Ltd.: *See*—
Yazaki, Yoshio; and Ogawa, Shinya, 4,599,297, Cl. 430-256.000.
Orion-yhtyma Oy: *See*—
Marvola, Martti L. A.; Marttila, Esko V.; Uotila, Jaakko A.; Pippuri, Aino K.; Kairisalo, Pekka J.; and Honkanen, Erkki J., 4,599,326, Cl. 514-29.000.
Orleansky, Eda: *See*—
Havkin, Michael; Orleansky, Eda; and Samson, Claude, 4,599,623, Cl. 343-756.000.
Orr, Alfred B.: *See*—
Monhardt, Richard J.; Orr, Alfred B.; and Wright, Joseph B., 4,598,449, Cl. 29-157.00R.
Osaka Gas Company Limited: *See*—
Mori, Hiromitsu; Akagi, Kosuke; and Kitahata, Hiroki, 4,598,541, Cl. 60-39.070.
Osaki, Ichiro: *See*—
Suematsu, Koushi; Hasegawa, Tetsuo; and Osaki, Ichiro, 4,599,289, Cl. 430-98.000.
Oscar Mayer Foods Corporation: *See*—
Borsuk, Alvin; Mally, Timothy G.; and Rattmann, James A., 4,599,025, Cl. 414-82.000.
Osterloh, Rolf: *See*—
Loch, Werner; Schupp, Eberhard; Osterloh, Rolf; Dobbelstein, Arnold; and Ahlers, Klaas, 4,599,371, Cl. 523-402.000.
Ostermann, Wolfgang: *See*—
Kugler, Wolfgang; and Ostermann, Wolfgang, 4,599,012, Cl. 404-10.000.
Ostling, Sture; and Lundgren, Bengt, to SKF Nova AB. Device for providing a clamping joint. 4,598,443, Cl. 24-136.00R.
Ostrow, Barnet: *See*—
Nobel, Fred I.; Ostrow, Barnet; and Schram, David N., 4,599,149, Cl. 204-44.400.
Oswald, Audrey M.: *See*—
Buddell, Robin L.; Oswald, Audrey M.; and Lagarde, William A., 4,599,480, Cl. 585-650.000.
Ota, Satoshi: *See*—
Takimoto, Masahiro; Ota, Satoshi; and Yamazaki, Yoshio, 4,599,376, Cl. 524-441.000.
Otis Elevator Company: *See*—
Koppensteiner, Werner, 4,598,798, Cl. 187-95.000.
Otsuji, Akira: *See*—
Hayashi, Saburo; Mukai, Mitsukazu; Inoue, Masahiro; Tsuchiya, Hiroo; Otsuji, Akira; and Tanabe, Takeo, 4,599,177, Cl. 210-718.000.

Otsuka Kagaku Kabushiki Kaisha: *See—*
Torii, Sigeru; Tanaka, Hideo; Sasaoka, Michio; Shiroi, Takashi; and Uto, Seiryu, 4,599,151, Cl. 204-59.00R.
Otten, David. Coin-telephone auditor. 4,599,492, Cl. 179-6.30R.
Ottinger, Brian D.: *See—*
Shum, Lanson Y.; and Ottinger, Brian D., 4,598,942, Cl. 294-106.000.
Otto Bilz, Werkzeugfabrik: *See—*
Ueberall, Paul, 4,599,019, Cl. 408-139.000.
Otto, Eberhard; Mutschelknaus, Rolf; and Hauptmann, Andreas, to Durr Anlagenbau GmbH. Treatment booth. 4,598,633, Cl. 98-115.200.
Ottoni, Franco: *See—*
Bruzzese, Tiberio; Dell'Acqua, Ernani; Ottoni, Franco; and van den Heuvel, Holger H., 4,599,406, Cl. 544-49.000.
Outboard Marine Corporation: *See—*
Bailey, Francis V., 4,598,757, Cl. 164-137.000.
Poehlman, Arthur G., 4,598,673, Cl. 123-73.0PP.
Outokumpu, Oy: *See—*
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Owens, Alexander H.; Halfacre, Mark A.; and Pan, David S., to Solid State Scientific, Inc. Method of making a CMOS EPROM with independently selectable thresholds. 4,598,460, Cl. 29-571.000.
Owens-Illinois, Inc.: *See—*
Matuszak, John J., 4,599,131, Cl. 156-584.000.
Oy Wartsila AB: *See—*
Oinonen, Hannu, 4,598,877, Cl. 242-66.000.
Ozaki, Satoru: *See—*
Kaneko, Takeru; Ozaki, Satoru; Takizawa, Kimie; and Sugimoto, Hachiro, 4,599,337, Cl. 514-265.000.
Ozdemir, Nazmi. Dosing apparatus for dispensing predetermined quantities preferably of beverages from a bottle. 4,598,845, Cl. 222-449.000.
P. J. Hare Limited: *See—*
Fisher, Kenneth W. J.; and Hare, Michael J., 4,599,675, Cl. 361-173.000.
Padilla, James M.; and Tomchak, Sigfrid A., to Pure Water International, Inc. Water purifier fitting and system. 4,599,171, Cl. 210-257.200.
Page, Donald F.: *See—*
Lesher, George Y.; Opalka, Chester J., Jr.; Page, Donald F.; and McGarry, Ruthann M., 4,599,423, Cl. 546-300.000.
Painley, Elmer F., to Rockwell International Corporation. Pulse generator. 4,598,594, Cl. 73-861.780.
Palosi, Endre: *See—*
Gonczi, Csaba; Korbonits, Dezso ; Palosi, Endre; Kiss, Pal; Heja, Gergely; Kun, Judit; Szomor nee Wundele, Maria; Szvoboda nee Kanzel, Ida; Marvanyos, Ede; Horvath, Karoly; Kovacs nee Mindler, Vera; and Nagy nee Koranyi, Livia, 4,599,428, Cl. 548-306.000.
Pan, David S.: *See—*
Owens, Alexander H.; Halfacre, Mark A.; and Pan, David S., 4,598,460, Cl. 29-571.000.
Pandeya, Prakash N.: *See—*
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Panetta, Patrick; and Wennet, Jack. Universal mammography compression system. 4,599,738, Cl. 378-037.000.
Papst-Motoren GmbH & Co KG: *See—*
Schuh, Bernard, 4,599,664, Cl. 360-97.000.
Park, Arthur; and Wilson, Bob T., to Diamond Oil Well Drilling Company. Method and apparatus for preventing contamination of a coring sponge. 4,598,777, Cl. 175-58.000.
Parke, Davis & Company: *See—*
Weinhold, Helmut, 4,598,621, Cl. 83-731.000.
Parker Chemical Company: *See—*
King, Peter F.; Farina, Samuel T.; and Korinek, Karl A., 4,599,116, Cl. 134-2.000.
Parnham, Michael J.: *See—*
Lautenschlager, Hans-Heiner; Parnham, Michael J.; and Prop, Gerrit, 4,599,205, Cl. 558-170.000.
Partridge, John J.: *See—*
Boris, Alfred; Partridge, John J.; and Uskokovic, Milan R., 4,599,330, Cl. 514-167.000.
Parviainen, Jaakko, to Perusyhtymae Oy. Feeding wood chipping. 4,598,745, Cl. 144-176.000.
Paski, Robert M., to AT&T Bell Laboratories. Clocked latching circuit. 4,599,526, Cl. 307-269.000.
Patchell, John W.: *See—*
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Patel, Navin D.: *See—*
Bell, Cecil R., Jr.; Lathery, Willie M.; Patel, Navin D.; and London, Jasper R., 4,598,817, Cl. 198-468.200.
Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH: *See—*
Steeger, Gerhard; and Plischke, Josef, 4,599,536, Cl. 313-493.000.
Paul, Lawrence L.; and Glaspie, Robert L. Arrow rest for bows. 4,598,688, Cl. 124-41.00A.
Paul Wurth S.A.: *See—*
Mahr, Rene ; and Lonardi, Emile, 4,599,028, Cl. 414-206.000.
Paulus, Wilfried: *See—*
Oeckl, Siegfried; Schmitt, Hans-Georg; Paulus, Wilfried; and Genth, Hermann, 4,599,427, Cl. 548-262.000.
Payne, James C.: *See—*
Wiley, Teddy E.; and Payne, James C., 4,598,825, Cl. 206-453.000.
Payne, Willard E.: *See—*
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Pearsall, Thomas P.: *See—*
Alavi, Kambiz; Cho, Alfred Y.; Pearsall, Thomas P.; and Temkin, Henryk, 4,599,728, Cl. 372-45.000.
Pedersen, Kristen I., to Sofec, Inc. Guide vane for a product swivel. 4,598,735, Cl. 137-615.000.
Pedotti, Antonio, to Fondazione Pro Juventute Don Carlo Gnocchi. Apparatus for clinically documenting postural vices and quantifying loads on body segments in static and dynamic conditions. 4,598,717, Cl. 128-779.000.
Peerless Tube Company: *See—*
Dombroski, Edward; and Potts, Richard W., 4,598,839, Cl. 222-92.000.
Peeters-Weem, Petrus J., to 501 Pella B. V. Pannigen. Folding wall. 4,598,751, Cl. 160-84.00R.
Peiffer, Dennis G.: *See—*
Duvdevani, Ilan; Schulz, Donald N.; Kitano, Kissho; and Peiffer, Dennis G., 4,599,377, Cl. 524-516.000.
Peitsmeier, Karl: *See—*
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Pelgrom, Marcellinus J. M.; Raven, Johannes G.; Slotboom, Jan W.; Harwig, Hendrik A.; and Annegarn, Marcellinus J. J. C., to U.S. Philips Corporation. Integrated memory circuit of a series-parallel-series type. 4,599,710, Cl. 365-238.000.
Pennella, Filippo: *See—*
Elliott, David J.; and Pennella, Filippo, 4,599,454, Cl. 568-387.000.
Pennington-Richards, Cyril M. Apparatus for helping a person to get in or out of a bath. 4,598,432, Cl. 4-563.000.
Pennock, Thomas G., to Moore Business Forms, Inc. Flip die cut label for folded mailer. 4,598,860, Cl. 229-69.000.
Pepper, Robert B. Ultrasonically operated water faucet. 4,598,726, Cl. 137-1.000.
Perkin-Elmer Corporation, The: *See—*
Atwood, John; Helms, Charles; and Scott, Raymond P. W., 4,598,765, Cl. 165-66.000.
Rangaswamy, Subramaniam; and Harrington, John H., 4,599,270, Cl. 428-402.000.
Perlov, Gena; and Tuchman, Samuel. Method and device for fluid transfer. 4,599,083, Cl. 623-3.000.
Permawick Bearing Corporation: *See—*
Abel, Martin L., 4,599,006, Cl. 384-136.000.
Persidsky, Maxim: *See—*
Borodulin, German; Shkolnik, Alexander; and Persidsky, Maxim, 4,598,435, Cl. 7-156.000.
Perusyhtymae Oy: *See—*
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Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., to Bayer Aktiengesellschaft. 7-(3-aryl-1-piperazinyl)- and 7-(3-cyclohexyl-1-piperazinyl)-3-quinolonecarboxylic acid antibacterials. 4,599,334, Cl. 514-253.000.
Peterson, Joe W.: *See—*
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Petit, Pierre; Grenier, Maurice; and Deschamps, Jean-Francois, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes George Claude. Process and device for vaporizing a liquid by heat exchange with a second fluid and their application in an air distillation installation. 4,599,097, Cl. 62-36.000.
Petry, Wolfgang: *See—*
Kohler, Michael; and Petry, Wolfgang, 4,599,110, Cl. 75-243.000.
Pfister, Jurg, deceased: *See—*
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Pfister, Lisa, administrator: *See—*
Boss, Hans; Pfister, Jurg, deceased; and Pfister, Lisa, administrator, 4,598,938, Cl. 285-382.200.
Pfizer Inc.: *See—*
Cajthaml, Peter, Jr.; and Hunter, James R., 4,598,859, Cl. 228-185.000.
Hoover, Dennis J., 4,599,198, Cl. 260-998.200.
Phase Industries Inc.: *See—*
LaBarbara, A. Franklin; Cann, Jeffrey; and Evans, Carey, 4,598,821, Cl. 206-329.000.
Phillips, Graham R.; and Nguyen, Vietson M., to Century Electric, Inc. Generator voltage regulator. 4,599,552, Cl. 322-28.000.
Phillips, Joseph: *See—*
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Phillips Petroleum Company: *See—*
Cobb, Raymond L., 4,599,472, Cl. 585-459.000.
Cymbaluk, Ted H.; Byers, Jim D.; and Johnson, Marvin M., 4,599,469, Cl. 570-193.000.
Drake, Charles A., 4,599,322, Cl. 502-150.000.
Drake, Charles A., 4,599,456, Cl. 568-421.000.
Elliott, David J.; and Pennella, Filippo, 4,599,454, Cl. 568-387.000.
Funk, Gary L., 4,598,669, Cl. 122-448.00R.
Gerhold, Bruce W., 4,599,160, Cl. 48-210.000.
Lacy, Robert H., 4,599,610, Cl. 340-721.000.
Scinta, James; and Moffat, Arlo J., 4,599,161, Cl. 201-16.000.

Phillips, Ronald: *See—*
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Piccardi, Paolo: *See—*
Bosone, Enrico; Caprara, Giuseppe; Corda, Francesco; Gozzo, Franco; Menconi, Augusto; Piccardi, Paolo; and Caprioli, Vincenzo, 4,599,358, Cl. 514-521.000.
Pickler, Nathan L. Trash compactor and transporting mechanism. 4,599,031, Cl. 414-507.000.
Pietrzok, Klaus-Peter: *See—*
Hersemeyer, Klaus; and Pietrzok, Klaus-Peter, 4,598,623, Cl. 89-34.000.
Pike, Brian R.: *See—*
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Pilipauskas, Daniel R.: *See—*
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Pincon, Andrew J. Method and apparatus for treating septic system with radiation activated fluid. 4,599,179, Cl. 210-760.000.
Pioneer Ansafone Manufacturing: *See—*
Iwasaki, Tadahisa, 4,599,662, Cl. 360-96.400.
Pioneer/Eclipse Corporation: *See—*
Wilson, William H., 4,598,440, Cl. 15-385.000.
Pioneer Electronic Corporation: *See—*
Nakayama, Kazuaki, 4,599,572, Cl. 330-69.000.
Yoshida, Kobun, 4,599,665, Cl. 360-105.000.
Piper Industries, Inc.: *See—*
Sousek, Eugene A., 4,598,535, Cl. 56-98.000.
Pippuri, Aino K.: *See—*
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Pirelli Limited: *See—*
Miln, James P., 4,598,949, Cl. 297-452.000.
Pisinger, Milos: *See—*
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Pitney Bowes, Inc.: *See—*
Sette, Paul R., 4,598,639, Cl. 101-110.000.
Tramposch, Herbert, 4,598,781, Cl. 177-211.000.
Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Miller, Kevin P.; and Luccarelli, Domenick, Jr., to International Flavors & Fragrances Inc. Flavoring with methylthioionene derivatives. 4,599,237, Cl. 426-535.000.
Pitzer, Dorman C.: *See—*
Jaycox, Jeffrey M.; and Pitzer, Dorman C., 4,599,554, Cl. 323-317.000.
Planer, Norman G.; and Zansky, Zoltan, to Honeywell Inc. Failsafe power-up/power-down switch. 4,599,672, Cl. 361-92.000.
Plantsch, Josef: *See—*
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Plasmafusion, Inc.: *See—*
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Plastic Specialties and Technologies, Inc.: *See—*
Grossman, Richard F.; and McKane, Francis W., Jr., 4,599,370, Cl. 523-200.000.
Pless, Benjamin D.; and Stotts, Lawrence J., to Intermedics, Inc. Power priority system. 4,599,523, Cl. 307-31.000.
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Podszun, Wolfgang; Witte, Josef; Uytterhoeven, Herman; and Goossens, John, to Agfa-Gevaert Aktiengesellschaft. Electrostatographic suspension developer of block copolymer reacted with mercaptan. 4,599,291, Cl. 430-114.000.
Poehlman, Arthur G., to Outboard Marine Corporation. Air-scavenged two-cycle internal combustion engine. 4,598,673, Cl. 123-73.0PP.
Pohl, Daniel P.: *See—*
Truskolaski, Bernard S.; and Pohl, Daniel P., 4,599,260, Cl. 428-207.000.
Pohl, Hans-Ulrich: *See—*
Wieland, Dieter; Meinert, Hartmut; and Pohl, Hans-Ulrich, 4,599,239, Cl. 426-590.000.
Poincenot, Rene , to Berthiez-Saint-Etienne. Device for mounting a tool-holder. 4,599,023, Cl. 409-233.000.
Poletto, John F.; and Bernstein, Seymour, to American Cyanamid Company. Oxalylamides useful as dental antiplaque agents and inhibitors of connective tissue destruction. 4,599,204, Cl. 260-507.00R.
Policastro, Peter P., to General Electric Company. Method for polymerizing lactams and products obtained therefrom. 4,599,393, Cl. 528-12.000.
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Pollini, Piero; Bertele, Giovanni M.; and Comoli, Ettore, to Bertele, Giovanni Marco; and Salice, Alessandro. Equipment for movement on water surface and towless aquatic ski. 4,599,072, Cl. 441-65.000.
Pollock, Jack H.: *See—*
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Polly, Marc: *See—*
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Polska Akademia Nauk Instytut Biocybernetyki i Inzynierii Biomedycznej: *See—*
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Polybac Corporation: *See—*
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Pommer, Ernst-Heinrich: *See—*
Rentzea, Costin; Buschmann, Ernst; Meyer, Norbert; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,599,335, Cl. 514-255.000.
Pongrass, Robert G.; and Rutter, Christopher C. Method and apparatus for forming, filling and sealing flexible plastic bags. 4,598,529, Cl. 53-452.000.
Ponticello, Ignazio S.: *See—*
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Poore, Albert C. G., to Sterling Drug Inc. Glazing system. 4,598,525, Cl. 52-776.000.
Poppelaars, Adrianus C.: *See—*
Kohaut, Gunter; Weber, Werner; Groenendijk, Herman; Poppelaars, Adrianus C.; and Janssen, Wilhelmus H. J., 4,599,269, Cl. 428-397.000.
Post, Martin F. M.; and Sie, Swan T., to Shell Oil Company. Process for the preparation of hydrocarbons. 4,599,481, Cl. 585-700.000.
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Potts, Richard W.: *See—*
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Powers, John A.: *See—*
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Powers, Robert A.: *See—*
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Pozulp, Kevin: *See—*
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PPG Industries, Inc.: *See—*
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Hodek, Robert B.; and Seiner, Jerome A., 4,599,398, Cl. 528-312.000.
Precision Fukuhara Works, Ltd.: *See—*
Sawazaki, Masatoshi, 4,598,560, Cl. 66-132.00T.
Precision Technologies: *See—*
DeWald, Carl O.; and Pollock, Jack H., 4,598,895, Cl. 251-78.000.
Precision Valve Australia Pty, Limited: *See—*
Duffield, Dean W., 4,599,126, Cl. 156-268.000.
Preuss, Bernhard; and Manthe, Karl-Heinz, to Siemens Aktiengesellschaft. Switch with a selective release. 4,599,590, Cl. 335-175.000.
Prevorsek, Dusan C.: *See—*
Kwon, Young D.; Kavesh, Sheldon; and Prevorsek, Dusan C., 4,599,267, Cl. 428-364.000.
Prince Corporation: *See—*
Flowerday, Carl W., 4,598,948, Cl. 297-411.000.
Hegel, Robert W.; and VanAppledorn, William, 4,598,574, Cl. 72-481.000.
Pringle, Ronald E., to Camco, Incorporated. Fail-safe well safety valve and method. 4,598,773, Cl. 166-373.000.
Prioul, Jean-Louis: *See—*
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Prisco, Anthony J.; and Johnson, Alfred N., to Westinghouse Electric Corp. Enclosure for sorting radioactive material. 4,599,513, Cl. 250-336.100.
Procter & Gamble Company, The: *See—*
LaHann, Thomas R., 4,599,342, Cl. 514-282.000.
Llenado, Ramon A., 4,599,188, Cl. 252-174.170.
Prop, Gerrit: *See—*
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Proteins Technology S.p.A., The: *See—*
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Provendier, Jacques H.: *See—*
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Pucel, Robert A.: *See—*
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Pulse Electronics, Inc.: *See—*
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Pure Water International, Inc.: *See—*
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Purkl, Walter: *See—*
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Brutel, Jean-Pierre; Leray, Yvon; and Quey, Louis, 4,598,880, Cl. 242-164.000.
Quick, Nicholas J., to Russell (Shears) Limited. Cutting device. 4,598,477, Cl. 30-260.000.
Quicksall, Carl O.: *See—*
Srinivasan, Viswanathan; and Quicksall, Carl O., 4,599,156, Cl. 204-182.400.
R. F. Monolithics, Inc.: *See—*
Hartmann, Clinton S.; and Wright, Peter, 4,599,587, Cl. 333-176.000.
R. Neumann & Co.: *See—*
Mulvaney, Lewis W., 4,598,429, Cl. 2-169.000.

R P & M Engines: *See*—
Jayne, Michael E.; and Gray, Robert B., 4,598,672, Cl. 123-56.0BC.
Raabe, Erwin: *See*—
Bons, Antonie; and Raabe, Erwin, 4,598,744, Cl. 144-1.00G.
Rabinowitz, Harold, to Nappe Babcock Co. Carrying case. 4,598,746, Cl. 150-52.00R.
Rabotski, John, to Summit Corporation of America. Machine for staking can leads. 4,598,446, Cl. 29-34.00R.
Rader, Edward F.: *See*—
Baleiko, Marc O.; and Rader, Edward F., 4,599,144, Cl. 203-15.000.
Rafalko, Joseph J.: *See*—
Bower, Esther A.; and Rafalko, Joseph J., 4,599,388, Cl. 525-433.000.
Ragland, Frank R., Jr., to RCA Corporation. Color picture tube having shadow mask frame with truncated corners. 4,599,533, Cl. 313-407.000.
Rainis, Andrew, to Chevron Research Company. Process for the manufacture of spherical bodies by selective agglomeration. 4,599,321, Cl. 502-8.000.
Rakoczi, Jozsef: *See*—
Foggassy, Elemer; Faigl, Ferenc; Soos, Rudolf; and Rakoczi, Jozsef, 4,599,444, Cl. 562-401.000.
Ralet, Daniel A. C. Plugcocks. 4,598,728, Cl. 137-15.000.
Rammelsberg, Gert-Dieter, to Litton Precision Products International GmbH. Absolute incremental encoder. 4,599,601, Cl. 340-347.00P.
Ramu, Tyamagondlu S.: *See*—
Wertheimer, Michael R.; and Ramu, Tyamagondlu S., 4,599,678, Cl. 361-323.000.
Ramuz, Henri: *See*—
Krasso, Anna; and Ramuz, Henri, 4,599,347, Cl. 514-338.000.
Rangaswamy, Subramaniam; and Harrington, John H., to Perkin-Elmer Corporation, The. Zirconium oxide powder containing cerium oxide and yttrium oxide. 4,599,270, Cl. 428-402.000.
Raptis, Apostolos C.: *See*—
Sheen, Shuh-Haw; and Raptis, Apostolos C., 4,598,593, Cl. 73-861.040.
Rasmussen, Robert, to Accurate Industries, Inc. Method for transporting containers. 4,599,040, Cl. 414-786.000.
Rath, Hans P.: *See*—
Bronstert, Klaus; Vogel, Hans-Henning; and Rath, Hans P., 4,599,433, Cl. 549-255.000.
Rattmann, James A.: *See*—
Borsuk, Alvin; Mally, Timothy G.; and Rattmann, James A., 4,599,025, Cl. 414-82.000.
Rausch, Helmut, to International Standard Electric Corporation. Two-frequency glide-path station for the standardized instrument-landing system ILS. 4,599,621, Cl. 343-410.000.
Raven, Johannes G.: *See*—
Pelgrom, Marcellinus J. M.; Raven, Johannes G.; Slotboom, Jan W.; Harwig, Hendrik A.; and Annegarn, Marcellinus J. J. C., 4,599,710, Cl. 365-238.000.
Ray, Curtis, to Varian Associates, Inc. Heating and cooling apparatus for chromatography column. 4,599,169, Cl. 210-175.000.
Ray, Francis M., to Zenith Electronics Corporation. Vibration damping nest for axial lead components. 4,598,813, Cl. 198-345.000.
Raytheon Company: *See*—
Herrelko, Edward J.; Hurley, James E.; and Day, William J., 4,598,691, Cl. 126-41.00R.
Mazin, Moshe, 4,599,704, Cl. 365-104.000.
Toch, Peter L., 4,599,535, Cl. 313-478.000.
Vorhaus, James L.; Bierig, Robert W.; and Pucel, Robert A., 4,599,585, Cl. 333-164.000.
Raz, Dan, to Electra Mikun (Industries) Ltd. Lifting apparatus. 4,599,033, Cl. 414-589.000.
RCA Corporation: *See*—
Carlson, David J., 4,599,652, Cl. 358-195.100.
Chandrasekhar, Hosekere S., 4,598,462, Cl. 29-577.00C.
Deyer, Craig E., 4,599,606, Cl. 340-365.00S.
Dischert, Robert A., 4,599,640, Cl. 358-50.000.
Goodlad, Albert P.; and De Stephanis, Ralph, 4,599,035, Cl. 414-697.000.
Harlan, Wayne E., 4,599,643, Cl. 358-74.000.
Hinn, Werner, 4,599,655, Cl. 358-242.000.
Keigler, John E.; and Hartshorne, Frank A., 4,599,619, Cl. 343-352.000.
Kelleher, Kevin C.; and Hughes, Larry M., 4,599,564, Cl. 324-251.000.
Monroe, Thomas D., 4,599,654, Cl. 358-228.000.
Ragland, Frank R., Jr., 4,599,533, Cl. 313-407.000.
Rodda, William E., 4,599,651, Cl. 358-168.000.
Steigmeier, Edgar F.; and Auderset, Heinrich, 4,598,997, Cl. 356-237.000.
Troiano, Anthony, 4,599,641, Cl. 358-39.000.
Truskalo, Walter; and Troiano, Anthony, 4,599,673, Cl. 361-150.000.
Willis, Donald H., 4,599,642, Cl. 358-65.000.
Realex Corporation: *See*—
Foster, Donald D.; Hills, Robert N.; Moore, David G.; and Nelson, Phil L., 4,598,843, Cl. 222-153.000.
Rebuffat, Carlo; and Rosati, Riccardo. Circular anastomosis. 4,598,712, Cl. 128-334.00C.
Reczek, James A.; Ponticello, Ignazio S.; and Bryan, Philip S., to Eastman Kodak Company. Polymeric mordant containing nitrogen-coordinating ligand for metallizable dyes. 4,599,389, Cl. 526-265.000.
Red Lion Controls: *See*—
McGuire, Donald W.; and Cordes, Harry B., 4,599,600, Cl. 340-347.00P.
Reden, Jurgen: *See*—
Bajwa, Balbir S., deceased; Chatterjee, Dipak K.; Ganguli, Bimal N.; Reden, Jurgen; and de Souza, Noel J., 4,599,409, Cl. 544-126.000.
Redfield, James W., to Commodore Business Machines Inc. Self booting logical or circuit. 4,599,528, Cl. 307-443.000.
Redi-Go Farm Services (1980)Ltd.: *See*—
Fletcher, Grant, 4,598,830, Cl. 212-195.000.
Reed, Joseph, to ITT Corporation. Baseband demodulator for FM and/or AM signals. 4,599,743, Cl. 455-207.000.
Reeve, Martin R.; and Gesing, Adam J., to Alcan International Limited. Refractory lining material for electrolytic reduction cell for aluminum production and method of making the same. 4,599,320, Cl. 501-96.000.
Regnet, Gunther; Harrer, Josef; Ludtke, Lothar; and Weber, Robert, to Kraftwerk Union Aktiengesellschaft. Cleaning equipment for the sealing surfaces of a vessel. 4,598,436, Cl. 15-21.00R.
Regnier, Gilbert; Guillonneau, Claude; Duhault, Jacques; and Roman, Francois, to Adir, S.A.R.L. Antimigraine 8-[3-(4-aminocarbonyl piperazino and piperidino) propyl]xanthines. 4,599,338, Cl. 514-265.000.
Reid, Daniel B. Composite concrete walls having tie and form spacer. 4,598,519, Cl. 52-426.000.
Reilly, Kenneth T.: *See*—
Douglas, Alan D.; MacInnis, Martin B.; and Reilly, Kenneth T., 4,599,222, Cl. 423-49.000.
Douglas, Alan D.; Reilly, Kenneth T.; MacInnis, Martin B.; Powers, John A.; and Christini, James N., 4,599,223, Cl. 423-49.000.
Reimert, Rainer: *See*—
Eichelsbacher, Michael; Kohlen, Rudolph; Reimert, Rainer; Hafke, Carl; and Schafer, Wolfgang, 4,599,092, Cl. 48-197.00R.
Reinecke, Paul: *See*—
Gayer, Herbert; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,599,350, Cl. 514-445.000.
Heywang, Gerhard; Reinecke, Paul; Brandes, Wilhelm; Haenssler, Gerd; and Hammann, Ingeborg, 4,599,349, Cl. 514-383.000.
Schmetzer, Johannes; Stetter, Jorg; Reinecke, Paul; and Hanssler, Gerd, 4,599,348, Cl. 514-383.000.
Reiss, Wolfgang: *See*—
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Reitz, Christopher J.; and Barrus, Jeffery C., to Motorola, Inc. Memory device retaining apparatus for portable data processor. 4,598,962, Cl. 339-17.00L.
Remington, Richard C. Hinge arrangement for model aircraft. 4,598,889, Cl. 244-87.000.
Renfer, Dale S.: *See*—
Limburg, William W.; and Renfer, Dale S., 4,599,286, Cl. 430-59.000.
Renishaw plc: *See*—
McMurtry, David R., 4,599,524, Cl. 307-119.000.
Renouvin, Daniel: *See*—
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Rentzea, Costin; Buschmann, Ernst; Meyer, Norbert; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. Diamine derivatives, compositions and use. 4,599,335, Cl. 514-255.000.
Research One Limited Partnership: *See*—
Wise, Sean; and MacKenzie, Mark L., 4,599,211, Cl. 264-82.000.
Reuter, Fritz: *See*—
Langen, Herbert; and Reuter, Fritz, 4,599,052, Cl. 417-413.000.
Reynolds, Graham A., to Rolls-Royce Limited. Gas turbine power plant. 4,598,542, Cl. 60-39.161.
Rhein-Chemie Rheinau GmbH: *See*—
Hugo, Peter; and Noack, Rainer, 4,599,425, Cl. 548-142.000.
Rheinmetall GmbH: *See*—
Romer, Rudolf; Simon, Walter; Boecker, Jurgen; and Bisping, Bernhard, 4,598,644, Cl. 102-521.000.
Rhodes, Richard O.: *See*—
Thompson, James R.; Armstrong, Errol C.; Wipfler, Richard T.; and Rhodes, Richard O., 4,598,450, Cl. 29-157.30V.
Rhone-Poulenc Agrochimie: *See*—
Mugnier, Jacques; Jung, Gerard; and Prioul, Jean-Louis, 4,599,312, Cl. 435-172.300.
Rhone-Poulenc Fibres: *See*—
Brutel, Jean-Pierre; Leray, Yvon; and Quey, Louis, 4,598,880, Cl. 242-164.000.
Rhone-Poulenc, Inc.: *See*—
Driscoll, Patrick R., 4,599,424, Cl. 548-140.000.
Gradeff, Peter S.; and Charte, Vincent J., 4,599,201, Cl. 260-414.000.
Theissen, Robert J., 4,599,442, Cl. 560-21.000.
Rice, Charles A., to Dow Chemical Company, The. Foam generating device and process. 4,598,862, Cl. 239-8.000.
Rice, Ronald B.; and Kosnosky, Theodore P., to Universal Manufacturing Corporation. Capacitor with integral discharge resistor and method of making same. 4,599,676, Cl. 361-275.000.
Rich, Leonard G., to Metromedia, Inc. Ink drop ejecting head. 4,599,626, Cl. 346-140.00R.
Richard, Herbert L., to United States of America, National Aeronautics and Space Administration. Multispectral linear array multiband selection device. 4,599,001, Cl. 356-419.000.

Richards, Robert D., to Northern Telecom Limited. Apparatus for multifrequency signalling tone detection. 4,599,495, Cl. 179-84.0VF.
Richle, Walter: *See—*
Muller, Arthur; and Richle, Walter, 4,599,405, Cl. 536-113.000.
Richmond Lox Equipment Company: *See—*
Bastian, Dale E., 4,598,554, Cl. 62-51.000.
Ricoh Company, Ltd.: *See—*
Ohtaki, Kazumi; and Sakamoto, Hiroshi, 4,599,630, Cl. 346-204.000.
Riederer, Manfred, to Wacker-Chemie GmbH. Continuous process for varying molecular weight of organopolysiloxanes. 4,599,437, Cl. 556-462.000.
Rieger, Kurt: *See—*
Kuhlmann, Herbert; and Rieger, Kurt, 4,598,667, Cl. 122-6.00A.
Riess, Guido; and Geiger, Albert, to Neodontics, Inc. Bone implant member for prostheses and bone connecting elements and process for the production thereof. 4,599,085, Cl. 623-16.000.
Rieter Machine Works, Ltd.: *See—*
Lattion, Andre , 4,598,881, Cl. 242-35.50A.
Schefer, Kurt, 4,598,876, Cl. 242-18.00A.
Riggin, Steven R. Trailer with improved folding gooseneck for carrying. 4,598,925, Cl. 280-425.00A.
Rikagaku Kenkyusho: *See—*
Misato, Tomomasa; Homma, Yasuo; Arimoto, Yutaka; Hidaka, Tohoru; and Yuda, Mitsuhara, 4,599,233, Cl. 424-127.000.
Riken Vitamin Oil Co., Ltd.: *See—*
Misato, Tomomasa; Homma, Yasuo; Arimoto, Yutaka; Hidaka, Tohoru; and Yuda, Mitsuhara, 4,599,233, Cl. 424-127.000.
Riker Laboratories, Inc.: *See—*
Banitt, Elden H., 4,599,434, Cl. 549-342.000.
Riley, James K.; and Miller-Jones, Stockton M., to General Electric Company. Method of CW doppler imaging using variably focused ultrasonic transducer array. 4,598,589, Cl. 73-609.000.
Rineer Hydraulics, Inc.: *See—*
Stone, Stephen R., 4,599,058, Cl. 418-221.000.
Ritter, David W., to Temporal Dynamics Research, Inc. Sound reproducing. 4,598,789, Cl. 181-144.000.
Rittscher, Peter: *See—*
Henne, Heinrich; Lohnherr, Ludger; Rittscher, Peter; and Holz, Walter, 4,598,872, Cl. 241-19.000.
Robbins, Max L.: *See—*
Cargle, Virgil H.; Robbins, Max L.; and Bock, Jan, 4,599,250, Cl. 427-220.000.
Robert Bosch GmbH: *See—*
Flohrs, Peter, 4,599,638, Cl. 357-51.000.
Hoppe, Karl-Heinz, 4,599,736, Cl. 375-110.000.
Lanfer, Hermann, 4,598,680, Cl. 123-425.000.
Trachte, Dietrich, 4,598,867, Cl. 239-453.000.
Robert Krups Stiftung & Co. KG: *See—*
Flammann, Norbert, 4,598,620, Cl. 83-399.000.
Roberts, Ronald L.; and Payne, Willard E., to General Semiconductor Industries, Inc. Two terminal axial lead suppressor and diode bridge device. 4,599,636, Cl. 357-76.000.
Roberts, Roy D., to ILC Technology, Inc. High intensity arc lamp. 4,599,540, Cl. 313-570.000.
Robertson, Forrest E.; and Williams, Donald E., to Acra-Plant, Inc. Furrow opener and follower blade. 4,598,654, Cl. 111-88.000.
Robertson, John W., Jr.; and Siegel, Stuart B., to Babcock & Wilcox Company, The. Digital generation of 3-phase PWM waveforms for variable speed control of induction motor. 4,599,550, Cl. 318-811.000.
Robertson, Michael C. Pipe cutting apparatus. 4,598,769, Cl. 166-55.000.
Robinson, Barton R.; and Tanney, John W., to Canadian Patents and Development Limited. Fluid density measuring apparatus. 4,598,578, Cl. 73-32.00R.
Robinson, Glen P.; and Blackshaw, Andrew L., to Southern Company Services, Inc. Integrated heat pump water heater. 4,598,557, Cl. 62-238.600.
Robinson, Paul R.; and Moorehead, Eric L., to Union Oil Company of California. Oxidative-dehydrogenation process. 4,599,477, Cl. 585-622.000.
Robinson, Tibor: *See—*
Heller, Jurg; Kissling, Bruno; Robinson, Tibor; and Valenti, Salvatore, 4,599,087, Cl. 8-495.000.
Rockwell International Corporation: *See—*
Haendel, Richard S.; and Wauer, John C., 4,599,618, Cl. 343-7.500.
McMullin, Wayne A., 4,599,724, Cl. 372-2.000.
Painley, Elmer F., 4,598,594, Cl. 73-861.780.
Tzeng, Chin-Pyng J., 4,599,525, Cl. 307-234.000.
Rodda, William E., to RCA Corporation. Pulse amplifier in a brightness control system. 4,599,651, Cl. 358-168.000.
Rodriquez, Jose A. Roller disc assembly and skate. 4,598,918, Cl. 280-11.240.
Roe, Joan A. P. Safety signal device. 4,598,661, Cl. 116-209.000.
Rogers Corporation: *See—*
Herrandez, Jorge M., 4,599,486, Cl. 174-72.00B.
Rogers, Edna Y.: *See—*
Kumar, Sampath, 4,599,403, Cl. 536-18.100.
Rogers, James W. Combined stripping and contact frame work station. 4,598,995, Cl. 355-91.000.
Rogers, Lloyd W.: *See—*
Compeau, Michael E.; and Rogers, Lloyd W., 4,598,932, Cl. 280-807.000.
Rohrer, Michael D.; and Bulard, Ronald A., to University of Oklahoma, Board of Regents for the. Apparatus for exposure to microwaves. 4,599,216, Cl. 422-21.000.
Rol, Pascal, to Lasag AG. Contact lens arrangement for optically examining an eye and treating it by light irradiation. 4,598,984, Cl. 351-219.000.
Rolls-Royce Limited: *See—*
Reynolds, Graham A., 4,598,542, Cl. 60-39.161.
Rolyan Manufacturing Co. Inc.: *See—*
Lindemann, Peer, 4,598,703, Cl. 128-94.000.
Roman, Francois: *See—*
Regnier, Gilbert; Guillonneau, Claude; Duhault, Jacques; and Roman, Francois, 4,599,338, Cl. 514-265.000.
Romer, Rudolf; Simon, Walter; Boecker, Jurgen; and Bisping, Bernhard, to Rheinmetall GmbH. Use of a portion of a propellant charge as a seal. 4,598,644, Cl. 102-521.000.
Rommen, Hans: *See—*
Bald, Wilfried; Stoy, Erich; Rommen, Hans; and Heisterkamp, Hans-Friedrich, 4,598,566, Cl. 72-243.000.
Romocki, Julian M. E.: *See—*
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Rosati, Riccardo: *See—*
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Rose, John T., to Mineral Research and Development Corp. Wood-treating composition. 4,599,192, Cl. 252-383.000.
Rose, William H.; Shaffer, David T.; and Walker, Philip J., to AMP Incorporated. Single and dual in-line package switch. 4,599,497, Cl. 200-5.00R.
Rosen, Josef: *See—*
Landa, Benzion; Rosen, Josef; and Schneider, Avner, 4,598,992, Cl. 355-3.0DR.
Rosen, Meyer R.: *See—*
Fan, You-Ling; Brode, George L.; and Rosen, Meyer R., 4,599,390, Cl. 526-240.000.
Rosen, Perry: *See—*
Chan, Ka-Kong; Holland, George W.; and Rosen, Perry, 4,599,443, Cl. 560-219.000.
Rosenberg, Robert: *See—*
Brownlow, James M.; and Rosenberg, Robert, 4,599,277, Cl. 428-552.000.
Rosenthal, Henry; and Kronhaus, Howard E., to Ha Di Ho. Apparatus and method for conveying, weighing and roll wrapping articles. 4,598,534, Cl. 53-588.000.
Rosier, Hendrik E.: *See—*
Mondello, Brian C.; and Rosier, Hendrik E., 4,598,572, Cl. 72-391.000.
Ross, Arden I., to Ross, Arden I.; and Ross, Wallace L., a part interest. Weight lifting type exercise machine. 4,598,907, Cl. 272-117.000.
Ross, Richard H., Jr.; and Longtin, Donald J., to United Technologies Corporation. Method and apparatus for manipulating miniature parts. 4,599,037, Cl. 414-752.000.
Ross, Wallace L.: *See—*
Ross, Arden I., 4,598,907, Cl. 272-117.000.
Rossi, Michele: *See—*
Fragale, Carlo; Gargano, Michele; and Rossi, Michele, 4,599,453, Cl. 568-387.000.
Rotbart, Guy, to Societe d'Exploitation Soremec-Chess. Circuit protection devices. 4,599,597, Cl. 337-206.000.
Roth, Erland, to Corvinus & Roth GmbH. Water trampoline. 4,598,904, Cl. 272-65.000.
Roth, Ernst: *See—*
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Roubal, Zdenek: *See—*
Fisnerova, Ludmila; Grimova, Jaroslava; Roubal, Zdenek; and Nemecek, Oldrich, 4,599,415, Cl. 544-284.000.
Rouffy, Jean C.: *See—*
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Roulland, Jean-Paul: *See—*
Charles, Jean-Michel; and Roulland, Jean-Paul, 4,599,164, Cl. 210-86.000.
Rubach, Frederic: *See—*
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Rudaz, Jean A., to Compagnie General de Geophysique. Seismic detector. 4,599,713, Cl. 367-178.000.
Rueckl, Roger L., to United States Steel Corporation. Coke oven door lining. 4,599,142, Cl. 202-242.000.
Ruff, Stanley L.; and Stubbmann, Albert, to Clik-Cut, Inc. Sheet material dispenser and methods of dispensing sheet material and of wrapping items. 4,598,531, Cl. 53-461.000.
Ruhrgas Aktiengesellschaft: *See—*
Eichelsbacher, Michael; Kohlen, Rudolph; Reimert, Rainer; Hafke, Carl; and Schafer, Wolfgang, 4,599,092, Cl. 48-197.00R.
Ruka, Roswell J.: *See—*
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Russell (Shears) Limited: *See—*
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Russemeyer, Hans; Pollak, Karl-Heinz; and Hoffmann, Gerhard, to Buhler-Miag GmbH. Method of and device for automatic charging a plurality of receiving stations with pulverized material. 4,599,017, Cl. 406-95.000.
Rutter, Christopher C.: *See—*
Pongrass, Robert G.; and Rutter, Christopher C., 4,598,529, Cl. 53-452.000.
Rutter, James D.: *See—*
Kutzli, Carl R.; and Rutter, James D., 4,598,816, Cl. 198-465.100.

Ryan, James: *See—*
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Ryason, P. R.: *See—*
Devries, Louis; and Ryason, P. R., 4,599,474, Cl. 585-415.000.

Ryobi Ltd.: *See—*
Fujii, Yutaka; and Shinmoto, Takahiko, 4,598,638, Cl. 101-76.000.
Tsuji, Toshihide; Ioka, Yoshinori; Anzai, Hisatugu; Kasahara, Noboru; and Katagiri, Fujio, 4,598,494, Cl. 49-2.000.

S M W Schneider & Weisshaupt GmbH: *See—*
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S.O.C. Corporation: *See—*
Arikawa, Hiroo; and Yuza, Yasutada, 4,599,596, Cl. 337-201.000.

Sachdev, Harbans S.; and Sachdev, Krishna G., to International Business Machines Corporation. Use of plasma polymerized organosilicon films in fabrication of lift-off masks. 4,599,243, Cl. 427-38.000.

Sachdev, Krishna G.: *See—*
Sachdev, Harbans S.; and Sachdev, Krishna G., 4,599,243, Cl. 427-38.000.

Sachse, Richard: *See—*
Machler, Meinrad; Machler, Sibylle; and Sachse, Richard, 4,598,715, Cl. 128-634.000.

Sack, Werner, to Schott-Glasswerke. PbO-free glasses for cathode ray tubes having a high protective effect against X-rays while simultaneously having good resistance to acid and stability to radiation. 4,599,319, Cl. 501-57.000.

Sage, Warnie L.: *See—*
Stringfellow, Thomas E.; and Sage, Warnie L., 4,598,653, Cl. 110-347.000.

Sailing Foundation, The: *See—*
Fryer, Douglas M.; Hayes, Frederick W.; and Marshall, Richard S., 4,599,073, Cl. 441-80.000.

Saito, Chuichi: *See—*
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Saito, Etsuro; Takahashi, Shinichiro; Yuasa, Masami; and Akiyama, Tsutomu, to Sony Corporation. Recording apparatus with stable disc support and high magnetic flux hold-down. 4,599,663, Cl. 360-97.000.

Saito, Isao; Ishibashi, Yoji; Ohmori, Takashi; Minakawa, Yoshimitsu; and Kuroda, Michio, to Hitachi, Ltd. Combustor for gas turbine. 4,598,553, Cl. 60-733.000.

Saito, Shunji, to Tokyo Electric Co., Ltd. Floppy disk drive apparatus. 4,599,659, Cl. 360-75.000.

Saitoh, Hiroshi; Kadooka, Katsuyuki; Tsukamoto, Mamoru; Ono, Shoji; and Ohkawa, Masaki, to Ma-Ma Macaroni Co., Ltd. Process for preparing boiled noodles. 4,599,238, Cl. 426-557.000.

Saitoh, Hiroyuki: *See—*
Kurata, Masami; and Saitoh, Hiroyuki, 4,598,999, Cl. 356-380.000.

Saitoh, Koichi; Itami, Teruhiko; Kimoto, Toshifumi; and Nishimura, Nobuo, to Fuji Xerox Co., Ltd. Thermo-magnetic recording method. 4,599,658, Cl. 360-59.000.

Sakaguchi, Yukihiko; Aono, Toshiaki; and Fujita, Shinsaku, to Fuji Photo Film Co., Ltd. Process for forming image. 4,599,296, Cl. 430-203.000.

Sakai, Junro: *See—*
Murakami, Shunichi; Ishida, Tetsuo; and Sakai, Junro, 4,599,069, Cl. 432-253.000.

Sakai, Keijiro: *See—*
Mutoh, Nobuyoshi; Sakai, Keijiro; Ueda, Akiteru; Ishibashi, Akira; and Okajima, Ikuo, 4,599,549, Cl. 318-798.000.

Sakai, Shinji; Ishizaki, Akira; and Kawabata, Takashi, to Canon Kabushiki Kaisha. Compression type A/D converter. 4,599,603, Cl. 340-347.0AD.

Sakai, Toshifumi: *See—*
Numazawa, Akio; Nakamura, Keiichi; and Sakai, Toshifumi, 4,599,051, Cl. 417-293.000.

Sakaki, Hiroshi; and Hashimoto, Kazuo, to Kokusai Denshin Denwa Co., Ltd. Tree transformation system in machine translation system. 4,599,691, Cl. 364-419.000.

Sakakibara, Eiichi: *See—*
Fujii, Setsuro; and Sakakibara, Eiichi, 4,599,404, Cl. 536-23.000.

Sakakiyama, Ryuzo, to Fuji Jukogyo Kabushiki Kaisha. Vehicular electromagnetic clutch control system having a throttle switch failure detecting circuit. 4,598,806, Cl. 192-0.075.

Sakamaki, Hisashi: *See—*
Tomosada, Masahiro; Maeshima, Katsuyoshi; Inuzuka, Tsuneki; and Sakamaki, Hisashi, 4,598,994, Cl. 355-14.00R.

Sakamoto, Hiroshi: *See—*
Ohtaki, Kazumi; and Sakamoto, Hiroshi, 4,599,630, Cl. 346-204.000.

Sakurai, Seiya: *See—*
Herzog, Hans K.; and Sakurai, Seiya, 4,598,890, Cl. 244-230.000.

Salamon, Zoltan; Imre nee Virag, Ilona; and Sebestyen, Magdolna, to Alkaloide Vegyeszeti Gyar. Chloromethyl quinoline derivatives and use thereof as analgesics. 4,599,345, Cl. 514-311.000.

Saleh, Abdel. Multiple pressure condenser for steam turbines, with heating devices for suppressing condensate overcooling. 4,598,767, Cl. 165-113.000.

Salice, Alessandro: *See—*
Pollini, Piero; Bertele, Giovanni M.; and Comoli, Ettore, 4,599,072, Cl. 441-65.000.

Samcoe Holding Corporation: *See—*
Diggle, Edmund A., Jr., 4,598,444, Cl. 26-84.000.

Samson, Claude: *See—*
Havkin, Michael; Orleansky, Eda; and Samson, Claude, 4,599,623, Cl. 343-756.000.

Sandell, Lionel S., to Du Pont de Nemours, E. I., and Company. Process for preparation of sulfonylurea solution formulations. 4,599,412, Cl. 544-211.000.

Sandi, Ernesto S.: *See—*
Anderson, Edward A.; and Sandi, Ernesto S., 4,599,263, Cl. 428-225.000.

Sandoz Ltd.: *See—*
Heller, Jurg; Kissling, Bruno; Robinson, Tibor; and Valenti, Salvatore, 4,599,087, Cl. 8-495.000.

Sanford, Norman R.; and Tumbush, Gerald L., to Warner & Swasey Company, The. AC excited transducer having stabilized phase sensitive demodulator circuit. 4,599,560, Cl. 324-207.000.

Sankyo Company Limited: *See—*
Fukami, Masaharu; Terada, Atsusuke; and Hasegawa, Kazue, 4,599,360, Cl. 514-570.000.

Sano, Nariaki; and Amano, Tetsuo, to Kabushiki Kaisha Yamashina Seikosho. Entering end portion of drill screw. 4,599,024, Cl. 411-387.000.

Sano, Shigeo: *See—*
Shimozono, Ryoji; Ogawa, Yasunori; Tanaka, Yasuo; and Sano, Shigeo, 4,599,583, Cl. 332-9.00R.

Sano, Shoichi: *See—*
Serizawa, Mitsuya; Sano, Shoichi; and Furukawa, Yoshimi, 4,598,788, Cl. 180-140.000.

Sansbury, Harold L. Device for adjustably positioning a cross bar. 4,598,906, Cl. 272-103.000.

Santrade Limited: *See—*
Liljekvist, Bernt S.; Nordmark, Bo Carl G.; and Tukala, Tommy S., 4,598,779, Cl. 175-410.000.

Sanyo Electric Co., Ltd.: *See—*
Moriki, Etsuzo; Miyazaki, Yoshifumi; and Nonoue, Torahiko, 4,599,545, Cl. 318-314.000.

Sara Lee Corporation: *See—*
Bell, Cecil R., Jr.; Lathery, Willie M.; Patel, Navin D.; and London, Jasper R., 4,598,817, Cl. 198-468.200.

Sargent, Robert W.: *See—*
Dougherty, William E., Jr.; Greer, Stuart E.; and Sargent, Robert W., 4,598,470, Cl. 29-837.000.

Sarkar, Arnab, to Lightwave Technologies, Inc. Optical fiber and method of producing same. 4,599,098, Cl. 65-3.120.

Sarkozi, Miklos: *See—*
Brennen, Michael B.; and Sarkozi, Miklos, 4,599,553, Cl. 323-205.000.

Sarumaru, Masahiko. Board for feeding single sheet paper. 4,598,903, Cl. 271-264.000.

Sasabe, Minoru: *See—*
Fujigiwa, Chikara; and Sasabe, Minoru, 4,598,879, Cl. 242-84.50R.

Sasaki Nouki Kabushiki Kaisha: *See—*
Asaoka, Yoshitaka; Higuchi, Takeo; and Kuji, Yoshiharu, 4,598,868, Cl. 239-659.000.

Sasaki, Yoshimitsu; Kajimura, Takashi; Chinone, Naoki; and Nakamura, Michiharu, to Hitachi, Ltd. Semiconductor laser device having facets provided with dielectric layers. 4,599,729, Cl. 372-49.000.

Sasaki, Yoshio: *See—*
Nono, Yasushi; and Sasaki, Yoshio, 4,598,674, Cl. 123-90.410.

Sasaoka, Michio: *See—*
Torii, Sigeru; Tanaka, Hideo; Sasaoka, Michio; Shiroi, Takashi; and Uto, Seiryu, 4,599,151, Cl. 204-59.00R.

Sasser, Bill H.; Eckstein, Roger J.; and Engle, Kenneth, to Motorola, Inc. Power divider/combiner apparatus comprising a fan shaped waveguide. 4,599,584, Cl. 333-125.000.

Sato, Hideo: *See—*
Yokono, Shigeru; Takahashi, Masatoshi; and Sato, Hideo, 4,599,076, Cl. 445-24.000.

Sato, Hozumi; Iwanaga, Shin-ichiro; Enyo, Hiroji; Takemura, Yasuhiko; and Kawamura, Yoshiaki, to Japan Synthetic Rubber Co., Ltd. Rubber composition comprising a thermosetting resin and a functional rubber-like copolymer. 4,599,382, Cl. 525-139.000.

Sato, Takanori: *See—*
Ohsumi, Yoshinori; and Sato, Takanori, 4,599,309, Cl. 435-68.000.

Satoh, Kenji: *See—*
Furuhata, Takashi; Nakama, Taihei; Abe, Yuuhei; and Satoh, Kenji, 4,599,569, Cl. 328-111.000.

Satoji, Fuminori, to NTN-Rulon Industries Co., Ltd. Polyamideimide resin composition. 4,599,383, Cl. 525-180.000.

Sauer, Hartmut K.; and Germann, Albrecht J., to De La Rue Giori S.A. Plate cylinder for intaglio printing plates in a web printing machine. 4,598,642, Cl. 101-415.100.

Sauerwald, Manfred: *See—*
Dockrer, Toni; Sauerwald, Manfred; Manegold, Jost H.; and Leitner, Hans, 4,599,202, Cl. 558-313.000.

Saunders, Alex M.; and Chang, Chin-Hai, to Becton, Dickinson and Company. Method for elimination of selected cell populations in analytic cytology. 4,599,307, Cl. 435-34.000.

Savin Corporation: *See—*
Landa, Benzion; Rosen, Josef; and Schneider, Avner, 4,598,992, Cl. 355-3.0DR.

Savio & C. S.p.A.: *See—*
Calamani, Sergio; and Turri, Eugenio, 4,598,656, Cl. 112-121.120.

Savioli, Giulio V., to United States of America, Army. Ammunition magazine. 4,598,490, Cl. 42-50.000.

Sawazaki, Masatoshi, to Precision Fukuhara Works, Ltd. Positive type yarn feeding device for knitting machine. 4,598,560, Cl. 66-132.00T.

Scalfarotto, Robert E., to American Cyanamid Company. Dewatering of wet paper webs using Mannich acrylamide polymers. 4,599,139, Cl. 162-168.300.

Schaefer, Daniel J., to Span-America Medical Systems, Inc. Shoulder abduction splint. 4,598,701, Cl. 128-87.00C.

Schafer, Doris; and Schafer, Rolf, to Alcon Laboratories, Inc. Solution and method for removing protein, lipid, and calcium deposits from contact lenses. 4,599,195, Cl. 252-546.000.

Schafer, Rolf: *See—*
Schafer, Doris; and Schafer, Rolf, 4,599,195, Cl. 252-546.000.

Schafer, Wolfgang: *See—*
Eichelsbacher, Michael; Kohlen, Rudolph; Reimert, Rainer; Hafke, Carl; and Schafer, Wolfgang, 4,599,092, Cl. 48-197.00R.

Schattschneider, George K., to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government. Long term current demand control system. 4,599,146, Cl. 204-1.00T.

Scheerer, Rainer, to Agfa-Gevaert Aktiengesellschaft. Color photographic recording material. 4,599,302, Cl. 430-506.000.

Schefer, Kurt, to Rieter Machine Works Limited. Winding machine for filament packages equipped with package screening means. 4,598,876, Cl. 242-18.00A.

Schering Aktiengesellschaft: *See—*
Arnold, Hanfried, 4,599,200, Cl. 260-239.55C.
Morgan, Thomas K., Jr., 4,599,344, Cl. 514-305.000.

Schickaneder, Helmut; Postius, Stefan; Herter, Rolf; Morsdorf, Peter; Szelenyi, Istvan; and Ahrens, Kurt H., to Ludwig Heumann & Co., GmbH. Propan-2-ol derivatives, a process for their production and medicaments containing these compounds. 4,599,346, Cl. 514-317.000.

Schiebelhuth, Heinz; Franke, Wolfgang; Kahlcke, Hartwig; and Oppermann, Gunter, to Braun Aktiengesellschaft. Multipurpose kitchen machine with working container. 4,599,003, Cl. 366-241.000.

Schiel, Christian; and Zurn, Georg, to J. M. Voith GmbH. Press roller with adjustable bowing means. 4,598,448, Cl. 29-116.0AD.

Schiessler, Siegfried; and Spietschka, Ernst, to Hoechst Aktiengesellschaft. Process for the preparation of naphthalene-1,4,5,8-tetracarboxylic acid and its 1,8-monoanhydride in a high degree of purity. 4,599,431, Cl. 549-232.000.

Schintlmeister, Wilfried; and Wallgram, Wolfgang, to Schwartzkopf Development Corporation. Wearing part. 4,599,281, Cl. 428-699.000.

Schirmer, Ulrich: *See—*
Seufert, Walter; Loeffler, Hans-Peter; Schirmer, Ulrich; Seppelt, Wolfgang; and Adolphi, Heinrich, 4,599,329, Cl. 514-119.000.

Schleifenbaum, Karl: *See—*
Kring, Werner; and Schleifenbaum, Karl, 4,598,598, Cl. 74-89.150.

Schloz, Gerhard, to Weitmann & Konrad GmbH & Co. KG. Device for the powder-dusting of moving objects, particularly flat substrates. 4,598,870, Cl. 239-696.000.

Schlunz, James R.; and Stillie, Donald G., to AMP Incorporated. Method for forming a hemispherically shaped switch assembly. 4,598,472, Cl. 29-848.000.

Schmerda, Richard F.: *See—*
Damiano, Michael A.; Kramer, Dennis M.; and Schmerda, Richard F., 4,599,555, Cl. 323-351.000.

Schmetzer, Johannes; Stetter, Jorg; Reinecke, Paul; and Hanssler, Gerd, to Bayer Aktiengesellschaft. 1-azolyl-substituted oxime ether fungicides. 4,599,348, Cl. 514-383.000.

Schmid, Eckhardt: *See—*
Egner-Walter, Bruno; and Schmid, Eckhardt, 4,598,438, Cl. 15-250.320.

Schmid, Martin: *See—*
Tronich, Gunter; and Schmid, Martin, 4,598,784, Cl. 180-19.200.

Schmidt, Manfred: *See—*
Dicke, Hans-Rudolf; Schmidt, Manfred; Witman, Mark; and El-Sayed, Aziz, 4,599,395, Cl. 528-173.000.

Schmidt, Robert: *See—*
Thomas, Rudolf; Eue, Ludwig; Schmidt, Robert; and Lurssen, Klaus, 4,599,448, Cl. 564-214.000.

Schmidt, Robert R.: *See—*
Forster, Heinz; Eue, Ludwig; and Schmidt, Robert R., 4,599,106, Cl. 71-100.000.

Schmidt, Werner; and Hahn, Bernd D., to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Transport and storage container assembly for low and medium level radioactive waste and method of filling the same. 4,599,518, Cl. 250-507.100.

Schmitt, Hans-Georg: *See—*
Oeckl, Siegfried; Schmitt, Hans-Georg; Paulus, Wilfried; and Genth, Hermann, 4,599,427, Cl. 548-262.000.

Schnackel, Jay F.: *See—*
Brooker, Arnold S.; and Schnackel, Jay F., 4,599,242, Cl. 427-34.000.

Schneckenberger, Marc G. Fluid and solid waste incineration system. 4,598,650, Cl. 110-246.000.

Schneider, Avner: *See—*
Landa, Benzion; Rosen, Josef; and Schneider, Avner, 4,598,992, Cl. 355-3.0DR.

Schneider, Eckhard; and Purkl, Walter, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Apparatus for separating laterally projecting imbricated printed copy products. 4,598,902, Cl. 271-205.000.

Scholl, Charles H.: *See—*
Sticher, Charles K.; and Scholl, Charles H., 4,598,842, Cl. 222-146.500.

Scholz, Hans-Jurgen; Brambilla, Luigi; Katz, Egon; Bossenmaier, Alban; and Zweigart, Gerhard, to Daimler-Benz Aktiengesellschaft. Vehicle sun visor. 4,598,943, Cl. 296-97.00H.

Schooley, Sharon Tippen: *See—*
Tippen, Lesley T., 4,598,783, Cl. 180-9.320.

Schott-Glasswerke: *See—*
Sack, Werner, 4,599,319, Cl. 501-57.000.

Schram, David N.: *See—*
Nobel, Fred I.; Ostrow, Barnet; and Schram, David N., 4,599,149, Cl. 204-44.400.

Schrank, Martin P.: *See—*
Hidler, Henry T.; Hope, Lawrence L.; Davey, Ernest A.; and Schrank, Martin P., 4,599,538, Cl. 313-512.000.

Schreiber, Alain B.; Kowalski, William J.; and Unger, Stefan H., to Syntex (U.S.A.) Inc. Etianic acids as antiangiogenics. 4,599,331, Cl. 514-179.000.

Schreiber, William L.: *See—*
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,599,468, Cl. 568-420.000.

Schroder, Gunter, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Method of removing chips from the end portion of an upwardly extending conduit. 4,598,727, Cl. 137-15.000.

Schroeder, Frederick R. Handlebar bicycle bag. 4,598,846, Cl. 224-36.000.

Schuh, Bernard, to Papst-Motoren GmbH & Co KG. Disk storage drive. 4,599,664, Cl. 360-97.000.

Schuitemaker, Frans: *See—*
Jarinko, Philip A.; Schuitemaker, Frans; and Bishop, Paul W., 4,598,864, Cl. 239-152.000.

Schulte, Bernhard; Tischer, Werner; Kaloff, Hans; and Weber, Hans-Leo, to Bayer Aktiengesellschaft. Electrically conductive polycarbonate laminates and their preparation. 4,599,262, Cl. 428-215.000.

Schultz, Donald L., to Clark Equipment Company. Travel/lift inhibit control. 4,598,797, Cl. 187-9.00E.

Schultz, Ronald D.: *See—*
Dees, H. Craig; and Schultz, Ronald D., 4,599,227, Cl. 424-38.000.

Schultz, Warren J., to Motorola Inc. PWM controller for an electrical load. 4,599,548, Cl. 318-599.000.

Schulz, Donald N.: *See—*
Duvdevani, Ilan; Schulz, Donald N.; Kitano, Kissho; and Peiffer, Dennis G., 4,599,377, Cl. 524-516.000.

Schumann, Klaus: *See—*
Wuhrmann, Juan C.; Brands, Karl D.; Mueller, Heinz; Schumann, Klaus; and Altenschoepfer, Theodor, 4,599,189, Cl. 252-174.150.

Schupp, Eberhard: *See—*
Loch, Werner; Schupp, Eberhard; Osterloh, Rolf; Dobbelstein, Arnold; and Ahlers, Klaas, 4,599,371, Cl. 523-402.000.

Schurmann, Hartmut: *See—*
Smarsly, Wilfried; Grundhoff, Karl J.; and Schurmann, Hartmut, 4,599,215, Cl. 419-42.000.

Schuster, Stanley E., to International Business Machines Corporation. Method and structure for machine data storage with simultaneous write and read. 4,599,708, Cl. 365-189.000.

Schwartzkopf Development Corporation: *See—*
Schintlmeister, Wilfried; and Wallgram, Wolfgang, 4,599,281, Cl. 428-699.000.

Schwarzberger, Michael: *See—*
Shore, Barry; and Schwarzberger, Michael, 4,598,810, Cl. 194-205.000.

Schwing, Ewald; Sommer, Peter; and Uhrner, Horst. Apparatus for the thermal removal of lacquer from metallic and ceramic articles. 4,599,067, Cl. 432-58.000.

Scinta, James; and Moffat, Arlo J., to Phillips Petroleum Company. Retorting process with contaminant removal. 4,599,161, Cl. 201-16.000.

Scott, Raymond P. W.: *See—*
Atwood, John; Helms, Charles; and Scott, Raymond P. W., 4,598,765, Cl. 165-66.000.

Scovill Inc.: *See—*
Krupicka, William A.; Butts, Lawrence D.; and Lampley, Sidney J., 4,598,939, Cl. 292-92.000.

Scripps Clinic and Research Foundation: *See—*
Milich, David R.; and Chisari, Frank V., 4,599,230, Cl. 424-89.000.
Milich, David R.; and Chisari, Frank V., 4,599,231, Cl. 424-89.000.

Sebestyen, Magdolna: *See—*
Salamon, Zoltan; Imre nee Virag, Ilona; and Sebestyen, Magdolna, 4,599,345, Cl. 514-311.000.

Seeger, Josef; and Kuckertz, Wilhelm. Gate valve having internal cooling structure. 4,598,732, Cl. 137-334.000.

Seevinck, Evert, to U.S. Philips Corporation. Protection circuit. 4,599,578, Cl. 330-298.000.

Seiko Epson Corporation: *See—*
Kawamura, Yoshikazu; Hosokawa, Minoru; Okazaki, Sakiho; and Ishii, Hiroshi, 4,599,005, Cl. 368-157.000.

Seiko Instruments & Electronics Ltd.: *See—*
Harajiri, Toshihiko; Motte, Shunichi; and Shinbo, Masafumi, 4,599,246, Cl. 427-86.000.

Seiner, Jerome A.: *See—*
Hodek, Robert B.; and Seiner, Jerome A., 4,599,398, Cl. 528-312.000.

Seitetsu Kagaku Co., Ltd.: *See—*
Hayashi, Saburo; Mukai, Mitsukazu; Inoue, Masahiro; Tsuchiya, Hiroo; Otsuji, Akira; and Tanabe, Takeo, 4,599,177, Cl. 210-718.000.

Seki, Toshimi: *See—*
Yasuda, Kikuo; Takezaki, Takayuki; Ohuchi, Rikio; Ohuyabu, Hiroshi; Tanimoto, Yoshitaka; Seki, Toshimi; Yamaguchi, Takashi; Izumi, Akihiro; Himori, Norio; and Ishimori, Tsutomu, 4,599,333, Cl. 514-247.000.

Sekino, Takeo; and Takeda, Masashi, to Sony Corporation. Analog-to-digital converter. 4,599,599, Cl. 340-347.0AD.

Sekiyama, Kenichi: *See—*
Yamamoto, Masami; Sekiyama, Kenichi; and Kuwayama, Kiyoaki, 4,598,900, Cl. 267-52.000.

Sekmakas, Kazys; and Shah, Raj, to DeSoto, Inc. Ureido-functional adhesion promoting amide monomers. 4,599,417, Cl. 544-316.000.

Selvin, Gerald J., to International Telephone and Telegraph Corporation. Electrical connector grounding ring. 4,598,959, Cl. 339-14.00R.

Semiconductor Energy Lab. Co., Ltd.: *See—*
Yamazaki, Shunpei, 4,599,482, Cl. 136-259.000.

Senderowicz, Daniel, to Intel Corporation. Switched capacitor filter utilizing a differential input and output circuit and method. 4,599,573, Cl. 330-107.000.

Senko Medical Instrument Mfg. Co., Ltd.: *See—*
Numazawa, Masaaki; and Tashiro, Hidetaka, 4,598,697, Cl. 128-1.00D.

Senstar Security Systems Corporation: *See—*
Edwards, Hugh A.; and Patchell, John W., 4,599,121, Cl. 156-48.000.

Seppelt, Wolfgang: *See—*
Seufert, Walter; Loeffler, Hans-Peter; Schirmer, Ulrich; Seppelt, Wolfgang; and Adolphi, Heinrich, 4,599,329, Cl. 514-119.000.

Serizawa, Mitsuya; Sano, Shoichi; and Furukawa, Yoshimi, to Honda Giken Kogyo Kabushiki Kaisha. Steering system for vehicles. 4,598,788, Cl. 180-140.000.

Serrano, Arthur L., to Novation, Inc. Apparatus for converting direct coupled data devices to acoustic coupled data devices. 4,599,491, Cl. 179-2.00C.

Sette, Paul R., to Pitney Bowes, Inc. Postal meter value selector system. 4,598,639, Cl. 101-110.000.

Seufert, Walter; Loeffler, Hans-Peter; Schirmer, Ulrich; Seppelt, Wolfgang; and Adolphi, Heinrich, to BASF Aktiengesellschaft. O,S-dialkyl S-[carbamyloxyalkyl] dithiophosphates and their use as pesticides. 4,599,329, Cl. 514-119.000.

Severs, Christopher W.; and Leonard, William L., to Cooper Industries, Inc. Earth anchor. 4,598,511, Cl. 52-157.000.

Shaffer, David T.: *See—*
Rose, William H.; Shaffer, David T.; and Walker, Philip J., 4,599,497, Cl. 200-5.00R.

Shah, Raj: *See—*
Sekmakas, Kazys; and Shah, Raj, 4,599,417, Cl. 544-316.000.

Shami, Yehezkel, to HSC Research Development Corporation. Multiple vessel specimen tray with lid for releasably adhering vessel covers. 4,599,314, Cl. 435-287.000.

Sharp Kabushiki Kaisha: *See—*
Aiba, Masahiko; Kuranishi, Masaaki; and Miyake, Hideyuki, 4,599,624, Cl. 346-75.000.
Fukuma, Yoshitaka; and Nakanishi, Tosaku, 4,599,613, Cl. 340-784.000.

Sheen, Shuh-Haw; and Raptis, Apostolos C., to United States of America, Energy. Acoustic cross-correlation flowmeter for solid-gas flow. 4,598,593, Cl. 73-861.040.

Shelhamer, Kenneth W.: *See—*
Cornell, Ronald G.; Huensch, George D.; Shelhamer, Kenneth W.; and Warty, Pramod, 4,599,490, Cl. 179-2.0EB.

Shell Oil Company: *See—*
Blytas, George C., 4,599,178, Cl. 210-737.000.
Buddell, Robin L.; Oswald, Audrey M.; and Lagarde, William A., 4,599,480, Cl. 585-650.000.
Drent, Eit, 4,599,476, Cl. 585-511.000.
Hart, William W. C.; and Korcz, William H., 4,599,261, Cl. 428-213.000.
Post, Martin F. M.; and Sie, Swan T., 4,599,481, Cl. 585-700.000.

Shell Western E&P Inc.: *See—*
Simpson, Wayne F., 4,599,013, Cl. 405-72.000.

Sherwood Medical Company: *See—*
Agdanowski, Ronald T.; and Geil, James A., 4,598,707, Cl. 128-207.150.

Shibayama, Kiyomi, to NSK Torrington Company, Ltd. Rolling body fitted to a holder. 4,598,957, Cl. 384-51.000.

Shigehara, Hiroshi: *See—*
Yamaguchi, Akira; Shigehara, Hiroshi; and Iseki, Hidemi, 4,599,580, Cl. 331-8.000.

Shimano Industrial Company Limited: *See—*
Ueno, Tadashi, 4,598,608, Cl. 74-594.200.

Shimbo, Takao, to Kabushiki Kaisha Toshiba. Autochanger type disc player. 4,599,716, Cl. 369-36.000.

Shimoya, Shigeo; and Iwasaki, Hikoji, to Kobishi Electric Co., Ltd. Tamper switch. 4,599,498, Cl. 200-16.00B.

Shimozono, Ryoji; Ogawa, Yasunori; Tanaka, Yasuo; and Sano, Shigeo, to Fujitsu Limited. Mixed dual frequency generating system. 4,599,583, Cl. 332-9.00R.

Shinbach, Madeline P., to Minnesota Mining and Manufacturing Company. Heat-sealable, laminated package. 4,598,826, Cl. 206-620.000.

Shinbo, Masafumi: *See—*
Harajiri, Toshihiko; Motte, Shunichi; and Shinbo, Masafumi, 4,599,246, Cl. 427-86.000.

Shinmoto, Takahiko: *See—*
Fujii, Yutaka; and Shinmoto, Takahiko, 4,598,638, Cl. 101-76.000.

Shinohara, Satoru: *See—*
Kobayashi, Naotake; Abe, Tetsuya; Shinohara, Satoru; and Fujiwara, Yoshio, 4,599,259, Cl. 428-204.000.

Shirai, Shoji; Yamauchi, Masaaki; Iidaka, Yoshiaki; Takano, Hiroshi; and Fukushima, Masakazu, to Hitachi, Ltd. Electron gun for color picture tube. 4,599,534, Cl. 313-414.000.

Shirataki, Kenji, to Tokai Shoji Co. Ltd. Method for applying emulsion onto screen printing plate. 4,599,248, Cl. 427-209.000.

Shiratori, Kazutoshi; Kodama, Takashi; Kawazoe, Mitsuo; Miyasaka, Tetsuo; and Nagao, Masaki, to Olympus Optical Co., Ltd. Apparatus for exposure correction. 4,598,986, Cl. 354-21.000.

Shirey, Richard, to Donn Incorporated. Suspension ceiling grid runner with expansion means. 4,598,514, Cl. 52-232.000.

Shiroi, Takashi: *See—*
Torii, Sigeru; Tanaka, Hideo; Sasaoka, Michio; Shiroi, Takashi; and Uto, Seiryu, 4,599,151, Cl. 204-59.00R.

Shkolnik, Alexander: *See—*
Borodulin, German; Shkolnik, Alexander; and Persidsky, Maxim, 4,598,435, Cl. 7-156.000.

Shoji, Hisashi: *See—*
Haneda, Satoshi; Shoji, Hisashi; and Hiratsuka, Seiichiro, 4,599,285, Cl. 430-54.000.

Shoji, Tadao: *See—*
Sugimoto, Hachiro; Hamano, Sachiyuki; and Shoji, Tadao, 4,599,414, Cl. 544-267.000.

Shore, Barry; and Schwarzberger, Michael, to ABM Industries, Inc. Apparatus and method for vending and accepting return of re-usable articles. 4,598,810, Cl. 194-205.000.

Shu, Winston R.; and Hartman, Kathy J., to Mobil Oil Corporation. Thermal recovery method for viscous oil. 4,598,770, Cl. 166-245.000.

Shulman, Morton. Composition and method for producing prolonged pain relief. 4,599,354, Cl. 514-530.000.

Shultz, Clifford G. Process for the thermal and chemical destruction of toxic and infectious biological materials. 4,599,141, Cl. 201-2.500.

Shum, Lanson Y.; and Ottinger, Brian D., to Westinghouse Electric Corp. Force-controlled gripper with adaptive accommodation. 4,598,942, Cl. 294-106.000.

Sibbers, Hartwig: *See—*
Stiller, Wilfried; Ulrich, Jorn; and Sibbers, Hartwig, 4,598,721, Cl. 131-375.000.

Sicpa Holding S.A.: *See—*
Amon, Albert; and Weil, Roger, 4,599,111, Cl. 106-21.000.

Sie, Swan T.: *See—*
Post, Martin F. M.; and Sie, Swan T., 4,599,481, Cl. 585-700.000.

Siegel, Stuart B.: *See—*
Robertson, John W., Jr.; and Siegel, Stuart B., 4,599,550, Cl. 318-811.000.

Siegerland-Bremsen Emde GmbH: *See—*
Kring, Werner; and Schleifenbaum, Karl, 4,598,598, Cl. 74-89.150.

Siegmund, Walter P., to Warner-Lambert Technologies, Inc. Diagnostic device. 4,598,698, Cl. 128-4.000.

Siegwart, Wolfgang, to Sipavag AG. Belt conveyor structure. 4,598,819, Cl. 198-861.100.

Siemens Aktiengesellschaft: *See—*
Falckenberg, Richard; Grabmaier, Christa; and Grabmaier, Josef, 4,599,244, Cl. 427-74.000.
Falckenberg, Richard; Grabmaier, Christa; and Grabmaier, Josef, 4,599,245, Cl. 427-74.000.
Klink, Gerhard; Kraske, Dietmar; Edinger, Egon; Koetter, Joachim; Krumrey, Klaus; Mayser, Jorg; and Michael, Ulrich, 4,598,459, Cl. 29-564.800.
Lutz, Gerhard, 4,598,474, Cl. 29-863.000.
Marsing, Helmut, 4,599,592, Cl. 335-216.000.
Muller, Manfred; and Klausecker, Karl, 4,599,686, Cl. 363-41.000.
Preuss, Bernhard; and Manthe, Karl-Heinz, 4,599,590, Cl. 335-175.000.
Vollert, Emmeran, 4,599,627, Cl. 346-140.00R.

Siemens Gammasonics, Inc.: *See—*
Stoub, Everett W., 4,599,690, Cl. 364-414.000.

SIG Societe Industrielle Suisse: *See—*
Ganz, Jorg, 4,598,645, Cl. 104-12.000.

Sigma Tau Industrie Faramaceutiche Riunite S.p.A.: *See—*
Bertelli, Alberto, 4,599,232, Cl. 424-94.000.

Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See—*
Tinti, Maria O., 4,599,447, Cl. 562-567.000.

Signetics Corporation: *See—*
Fang, Sheng, 4,599,707, Cl. 365-185.000.

Silver, Lester; and Goldenberg, Barry, to Miles Laboratories, Inc. Enhanced soft tissue flap survival in reconstructive surgery. 4,599,340, Cl. 514-277.000.

Silverman, Daniel; and Johnson, Everett A. Access security control. 4,599,509, Cl. 235-382.000.

Siman, Jaime E., to Westinghouse Electric Corp. Electrical inductive apparatus. 4,599,594, Cl. 336-92.000.

Simon, Walter: *See—*
Romer, Rudolf; Simon, Walter; Boecker, Jurgen; and Bisping, Bernhard, 4,598,644, Cl. 102-521.000.

Simpson, Wayne F., to Shell Western E&P Inc. Fireproof boom. 4,599,013, Cl. 405-72.000.

Singer Company, The: *See—*
Zylbert, Thaddeus J., 4,598,753, Cl. 163-5.000.

Singletary, Winfield S., Jr., to U.S. Clinical Products, Inc. Flexible sterile closure system for a container with a side injection port. 4,598,834, Cl. 215-232.000.

Sipavag AG: *See—*
Siegwart, Wolfgang, 4,598,819, Cl. 198-861.100.

Sircar, Ila, to Warner-Lambert Company. 4,5-dihydro-6-[2-[4-(1H-imidazol-1-yl)phenyl]-ethenyl]-3(2H)-pyridazinones and related compounds. 4,599,332, Cl. 514-247.000.

Siseido Co., Ltd.: *See—*
Hamaguchi, Masami; Taguchi, Toshio; Nozawa, Takamitsu; and Ogawa, Riichi, 4,598,865, Cl. 239-342.000.

Skaalen, Clifford I.; Lange, Herman G.; and Springston, Preston S., to United States of America, Navy. Marginal terrain straddle-lift container handler. 4,599,030, Cl. 414-460.000.
SKF Nova AB: *See*—
Ostling, Sture; and Lundgren, Bengt, 4,598,443, Cl. 24-136.00R.
Skrocki, Roger R., to TRW Inc. Explosive charge liner made of a single crystal. 4,598,643, Cl. 102-307.000.
Slack, Thomas B.: *See*—
Tan, Chuan-Chieh; Slack, Thomas B.; and Denenberg, Jeffrey N., 4,599,692, Cl. 364-513.000.
Slapsys, Michael; and Everitt, Brian T., to Donn Incorporated. Suspension ceiling grid with end connector. 4,598,521, Cl. 52-484.000.
Sloan, Frederick; and Chambers, William. Hand tool with visual display means. 4,598,740, Cl. 140-124.000.
Slotboom, Jan W.: *See*—
Pelgrom, Marcellinus J. M.; Raven, Johannes G.; Slotboom, Jan W.; Harwig, Hendrik A.; and Annegarn, Marcellinus J. J. C., 4,599,710, Cl. 365-238.000.
Slough, Carlton M., to Texaco Inc. Safety means and method for the handling of flammable fluids. 4,599,045, Cl. 417-44.000.
Smarsly, Wilfried; Grundhoff, Karl J.; and Schurmann, Hartmut. Process and device for producing compressed mouldings from loose or sintered metal powder. 4,599,215, Cl. 419-42.000.
Smetaniuk, Peter: *See*—
Smetaniuk, Terrace S., 4,599,508, Cl. 235-116.000.
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Smiles, Harry, to Nordson Corporation. Thermoplastic dispensing gun having a self-contained filter and flow control valve. 4,598,841, Cl. 222-146.500.
Smith, Bernard R., to Ayr Pty. Ltd. Electrical power supply for a motor vehicle. 4,599,687, Cl. 363-61.000.
Smith, David C.: *See*—
Smith, Margaret M.; and Smith, David C., 4,598,709, Cl. 128-303.180.
Smith, David W.: *See*—
Cammack, Michael A.; and Smith, David W., 4,598,866, Cl. 239-447.000.
Smith International, Inc.: *See*—
Crase, Gary M., 4,599,056, Cl. 418-48.000.
Smith, Margaret M.; and Smith, David C., to Clare, Inc. Electrolysis machine. 4,598,709, Cl. 128-303.180.
Smith, Paul. Leaf spring vehicle suspension. 4,598,930, Cl. 280-712.000.
SmithKline Beckman Corporation: *See*—
Ali, Fadia E.; and Huffman, William F., 4,599,324, Cl. 514-11.000.
Smolik, Robert A. Electrical receptacle box assembly. 4,599,485, Cl. 174-57.000.
SMS Schloemann-Siemag AG: *See*—
Bald, Wilfried; Stoy, Erich; Rommen, Hans; and Heisterkamp, Hans-Friedrich, 4,598,566, Cl. 72-243.000.
Socapex: *See*—
Bricaud, Herve ; Rouffy, Jean C.; and L'Henaff, Patrick, 4,598,965, Cl. 339-75.0MP.
Societe Anonyme D.B.A.: *See*—
Thioux, Alain, 4,598,799, Cl. 188-71.500.
Societe Anonyme de Telecommunications: *See*—
Beaudet, Didier M.; and Nicole, Pierre, 4,599,527, Cl. 307-310.000.
Kerdoncuff, Guy P.; and Provendier, Jacques H., 4,599,700, Cl. 364-721.000.
Societe Chimique des Charbonnages S.A.: *See*—
Meyer, Nicolas; and Cousin, Michel, 4,599,212, Cl. 264-255.000.
Societe d'Exploitation Soremec-Chess: *See*—
Rotbart, Guy, 4,599,597, Cl. 337-206.000.
Societe Nationale Elf Aquitaine: *See*—
Vio, Lino; and Meunier, Gilles, 4,599,180, Cl. 252-8.55D.
Societe Normande de Confection: *See*—
Letard, Michel; Renouvin, Daniel; and Dupont, Joseph, 4,598,919, Cl. 280-79.10R.
Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux Efcis: *See*—
Bernard, Patrick, 4,599,575, Cl. 330-258.000.
Sofec, Inc.: *See*—
Pedersen, Kristen I., 4,598,735, Cl. 137-615.000.
Sokolove, Robert L.: *See*—
Bennett, Robert P.; and Sokolove, Robert L., 4,599,249, Cl. 427-220.000.
Solco Basel AG: *See*—
Wittenberger, Udo, 4,599,176, Cl. 210-639.000.
Solid State Scientific, Inc.: *See*—
Owens, Alexander H.; Halfacre, Mark A.; and Pan, David S., 4,598,460, Cl. 29-571.000.
Sommer Co.: *See*—
Sommer, Gordon M., 4,598,804, Cl. 192-0.02R.
Sommer, Gordon M., to Sommer Co. Motor drive system. 4,598,804, Cl. 192-0.02R.
Sommer, Peter: *See*—
Schwing, Ewald; Sommer, Peter; and Uhrner, Horst, 4,599,067, Cl. 432-58.000.
Sony Corporation: *See*—
Kobayashi, Naotake; Abe, Tetsuya; Shinohara, Satoru; and Fujiwara, Yoshio, 4,599,259, Cl. 428-204.000.
Kubo, Takashi, 4,599,531, Cl. 310-111.000.
Saito, Etsuro; Takahashi, Shinichiro; Yuasa, Masami; and Akiyama, Tsutomu, 4,599,663, Cl. 360-97.000.
Sekino, Takeo; and Takeda, Masashi, 4,599,599, Cl. 340-347.0AD.
Wilkinson, James H., 4,599,650, Cl. 358-148.000.
Yokono, Shigeru; Takahashi, Masatoshi; and Sato, Hideo, 4,599,076, Cl. 445-24.000.
Soos, Rudolf: *See*—
Foggassy, Elemer; Faigl, Ferenc; Soos, Rudolf; and Rakoczi, Jozsef, 4,599,444, Cl. 562-401.000.
Sorkin, Harry W.: *See*—
Kumar, Sampath, 4,599,403, Cl. 536-18.100.
Sorriero, Louis J.: *See*—
Yoerger, William E.; and Sorriero, Louis J., 4,599,290, Cl. 430-108.000.
Sorsche, Joachim H.; and Peitsmeier, Karl, to Daimler-Benz Aktiengesellschaft. Steering device for motor vehicles, adjustable along its longitudinal axis. 4,598,604, Cl. 74-493.000.
Souques, Georges: *See*—
Thire, Jacques; and Souques, Georges, 4,599,633, Cl. 357-38.000.
Sousek, Eugene A., to Piper Industries, Inc. Adjustable multiple row harvester head assembly. 4,598,535, Cl. 56-98.000.
Southern Company Services, Inc.: *See*—
Robinson, Glen P.; and Blackshaw, Andrew L., 4,598,557, Cl. 62-238.600.
Southwest Research Institute: *See*—
Gibson, William C.; Tomlinson, William M.; Goldstein, Eugene T.; and Ferguson, George A., 4,599,680, Cl. 361-386.000.
SPA-Societa Prodotti Antibiotici spa: *See*—
Bruzzese, Tiberio; Dell'Acqua, Ernani; Ottoni, Franco; and van den Heuvel, Holger H., 4,599,406, Cl. 544-49.000.
Span-America Medical Systems, Inc.: *See*—
Schaefer, Daniel J., 4,598,701, Cl. 128-87.00C.
Spanko, Jacob E., to Spanko, Jacob E. Feline protective garment. 4,598,666, Cl. 119-106.000.
Spears, Harry L. Travelling valve assembly for a fluid pump. 4,599,054, Cl. 417-456.000.
Spector, George: *See*—
Brown, Phillip H.; and Spector, George, 4,598,637, Cl. 99-580.000.
Speer, Spencer J., to General Dynamics Pomona Division. Infrared target sensor and system. 4,598,884, Cl. 244-3.160.
Sperry Corporation: *See*—
Cloke, Robert L., 4,599,570, Cl. 328-155.000.
Tarbuck, Robert R., 4,599,036, Cl. 414-730.000.
Spietschka, Ernst; and Troster, Helmut, to Hoechst Aktiengesellschaft. Perylene-3,4,9,10-tetracarboxylic acid monoanhydride monoimides. 4,599,408, Cl. 544-125.000.
Spietschka, Ernst: *See*—
Schiessler, Siegfried; and Spietschka, Ernst, 4,599,431, Cl. 549-232.000.
SPOFA, spojene podniky pro zdravotnickou vyrobu: *See*—
Fisnerova, Ludmila; Grimova, Jaroslava; Roubal, Zdenek; and Nemecek, Oldrich, 4,599,415, Cl. 544-284.000.
Springston, Preston S.: *See*—
Skaalen, Clifford I.; Lange, Herman G.; and Springston, Preston S., 4,599,030, Cl. 414-460.000.
Sramek, Rudolf: *See*—
Kroupa, Petr; Sramek, Rudolf; and Fantl, Jiri, 4,598,537, Cl. 57-5.000.
Srinivasan, Viswanathan; and Quicksall, Carl O., to International Minerals & Chemical Corp. Electrodialysis process for preparing hydrogen fluoride. 4,599,156, Cl. 204-182.400.
Stadler, Agnes: *See*—
Nogradi, Mihaly; Korbonits, Dezso ; Gottsegen, Agnes; Antus, Sandor; Furst, Zsuzsa; Knoll, Jozsef; Szejtli, Jozsef; Stadler, Agnes; Kovacs, Gabor; and Marmarosi, Katalin, 4,599,327, Cl. 514-58.000.
Stadler, Lothar, to Heidelberger Druckmaschinen AG. Bending device for offset printing plates. 4,598,568, Cl. 72-320.000.
Stage, Hermann. Process for deodorizing and/or physical refining of high-boiling organic edible oils, fats and esters. 4,599,143, Cl. 203-6.000.
Stahlecker, Fritz; and Stahlecker, Hans, to Stahlecker, Hans; and Stahlecker, Fritz. Yarn piecing arrangement for an open-end friction spinning machine. 4,598,539, Cl. 57-263.000.
Stahlecker, Hans: *See*—
Stahlecker, Fritz; and Stahlecker, Hans, 4,598,539, Cl. 57-263.000.
Stamberg, Jiri: *See*—
Dautzenberg, Horst; Loth, Fritz; Borrmeister, Bodo; Bertram, Dieter; Lettau, Herbert; Stamberg, Jiri; and Peska, Jan, 4,599,209, Cl. 264-7.000.
Stamicarbon B.V.: *See*—
van der Stoel, Roland E.; and Bosma, Marcel A. R., 4,599,421, Cl. 546-251.000.
Standard Oil Company, The: *See*—
Milberger, Ernest C.; and Wong, Eunice K. T., 4,599,430, Cl. 548-548.000.
Standard Oil Company (Indiana): *See*—
Baleiko, Marc O.; and Rader, Edward F., 4,599,144, Cl. 203-15.000.
Standard Telephones & Cables, plc: *See*—
Dwyer, Douglas F. G.; and Bower, David E., 4,598,587, Cl. 73-517.00R.
Stanfield, Billy M., to Gore, Thomas. Fish gaff. 4,598,492, Cl. 43-5.000.
Stanton, James L.; and Gruenfeld, Norbert, to Ciba-Geigy Corporation. 1-mercaptoalkanoylindoline-2-carboxylic acids. 4,599,357, Cl. 514-419.000.
State of Israel, Atomic Energy Commission, Nuclear Research Center Negev, The: *See*—
Ketzinel, Zvi; Volkman, Ygal; and Hassid, Moshe, 4,599,221, Cl. 423-7.000.

Stearns Catalytic World Corporation: *See—*
Stringfellow, Thomas E.; and Sage, Warnie L., 4,598,653, Cl. 110-347.000.
Steckel, Thomas F., to Lubrizol Corporation, The. Method for preparing nitrogen- and oxygen-containing compositions useful as lubricant and fuel additives. 4,599,090, Cl. 44-63.000.
Steeger, Gerhard; and Plischke, Josef, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH. Single-ended low-pressure discharge lamp, such as fluorescent lamp, and method of its manufacture. 4,599,536, Cl. 313-493.000.
Steffan, Walter J. Motorized fishing reel. 4,598,878, Cl. 242-84.10A.
Steg, Robert F., Jr. Extracorporeal blood processing system. 4,599,093, Cl. 55-16.000.
Steigmeier, Edgar F.; and Auderset, Heinrich, to RCA Corporation. Apparatus and method for detecting defects and dust on a patterned surface. 4,598,997, Cl. 356-237.000.
Steinbock GmbH: *See—*
Tronich, Gunter; and Schmid, Martin, 4,598,784, Cl. 180-19.200.
Steinhauser, Eberhard. Metering cell. 4,598,583, Cl. 73-202.000.
Stemmler, Kurt, to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG. Apparatus for the manufacture of absorption pads for absorbing body fluid. 4,598,441, Cl. 19-145.000.
Stephan-Werke GmbH: *See—*
Bons, Antonie; and Raabe, Erwin, 4,598,744, Cl. 144-1.00G.
Stephens, Eugene, to DeVerohn Corporation. Position responsive lighting apparel. 4,599,682, Cl. 362-103.000.
Stephens, Eugene S.: *See—*
Haltof, Garry P.; Stephens, Eugene S.; and Czubachowski, Zygmunt J., 4,598,498, Cl. 49-407.000.
Stephenson, Roger C., to Automation Industries, Inc. Termination means. 4,598,969, Cl. 339-143.00R.
Sterling Drug Inc.: *See—*
Lesher, George Y.; Opalka, Chester J., Jr.; Page, Donald F.; and McGarry, Ruthann M., 4,599,423, Cl. 546-300.000.
Poore, Albert C. G., 4,598,525, Cl. 52-776.000.
Stetter, Jorg: *See—*
Schmetzer, Johannes; Stetter, Jorg; Reinecke, Paul; and Hanssler, Gerd, 4,599,348, Cl. 514-383.000.
Stewart-Cox, Adrian R.; and Bryant, Robert G., to British-American Tobacco Company Limited. Cigarette manufacturing machines. 4,599,699, Cl. 364-552.000.
Stewart, Gary E. Business form with packing label and method of use. 4,598,935, Cl. 283-81.000.
Stewart, Robert C.; and Hart, Colin O. Industrial suction apparatus. 4,599,048, Cl. 417-85.000.
Sticher, Charles K.; and Scholl, Charles H. Sequenced heating for hot melt adhesive dispensing system. 4,598,842, Cl. 222-146.500.
Stigsson, Lars L.; and Lindman, Bjorn, to Fluidcarbon International AB. Coal-water dispersion. 4,599,089, Cl. 44-51.000.
Stiller, Bruno V. Card reading system. 4,599,511, Cl. 235-459.000.
Stiller, Wilfried; Ulrich, Jorn; and Sibbers, Hartwig, to B.A.T. Cigaretten-Fabriken GmbH. Method and apparatus for producing crimped fibre pieces of reconstituted tobacco. 4,598,721, Cl. 131-375.000.
Stillie, Donald G.: *See—*
Schlunz, James R.; and Stillie, Donald G., 4,598,472, Cl. 29-848.000.
Stilwell, George R., Jr.: *See—*
Munn, Robert D.; and Stilwell, George R., Jr., 4,598,974, Cl. 350-96.210.
Stobbart, Brian C. Locking device. 4,598,893, Cl. 248-548.000.
Stol, Israel: *See—*
Burke, Michael A.; and Stol, Israel, 4,599,506, Cl. 219-130.010.
Stolpman, James L., to King Radio Corporations. Method and apparatus for evaluating the range data accumulated by distance measuring equipment. 4,599,617, Cl. 343-7.300.
Stone, Stephen R., to Rineer Hydraulics, Inc. Vane slots for a fluid power converter. 4,599,058, Cl. 418-221.000.
Stork Brabant: *See—*
Blaak, Cornelis, 4,599,208, Cl. 261-83.000.
Stotts, Lawrence J.: *See—*
Piess, Benjamin D.; and Stotts, Lawrence J., 4,599,523, Cl. 307-31.000.
Stoub, Everett W., to Siemens Gammasonics, Inc. Method and circuit for correcting count rate losses of radiation events. 4,599,690, Cl. 364-414.000.
Stout, Gregg W., to Baker Oil Tools, Inc. Method and apparatus for firing multisection perforating guns. 4,598,776, Cl. 175-4.540.
Stoy, Erich: *See—*
Bald, Wilfried; Stoy, Erich; Rommen, Hans; and Heisterkamp, Hans-Friedrich, 4,598,566, Cl. 72-243.000.
Stratil, Tomas; Pisinger, Milos; and Fehr, Peter, to LGZ Landis & Gyr Zug AG. Covering means and method for protecting the surface of a soldering bath. 4,598,858, Cl. 228-180.100.
Stricker, John G. Variable camber tandem blade bow for turbomachines. 4,599,041, Cl. 415-130.000.
Stringfellow, Thomas E.; and Sage, Warnie L., to Stearns Catalytic World Corporation. Combustion system for burning fuel having various particle sizes. 4,598,653, Cl. 110-347.000.
Strok, Jack M., to General Electric Company. Time fuse for high pressure sodium lamps. 4,599,543, Cl. 315-73.000.
Stubbmann, Albert: *See—*
Ruff, Stanley L.; and Stubbmann, Albert, 4,598,531, Cl. 53-461.000.
Stukenberg, John R.: *See—*
Benjes, Henry H.; Wahbeh, Valery N.; and Stukenberg, John R., 4,599,167, Cl. 210-150.000.
Benjes, Henry H.; Wahbeh, Valery N.; and Stukenberg, John R., 4,599,168, Cl. 210-151.000.
Suematsu, Koushi; Hasegawa, Tetsuo; and Osaki, Ichiro, to Canon Kabushiki Kaisha. Pressure-fixable encapsulated toner. 4,599,289, Cl. 430-98.000.
Sugano, Mamoru: *See—*
Kikumoto, Ryoji; Fukami, Harukazu; Hara, Hiroto; Ninomiya, Kunihiro; and Sugano, Mamoru, 4,599,419, Cl. 544-391.000.
Sugao, Keizo, to Usui Kokusai Sangyo Kabushiki Kaisha. Pipe having a double flared end. 4,598,937, Cl. 285-55.000.
Sugi, Hiromi: *See—*
Furumura, Kyozaburo; Sugi, Hiromi; Murakami, Yasuo; and Asai, Hiromitsu, 4,598,914, Cl. 277-80.000.
Sugimoto, Hachiro; Hamano, Sachiyuki; and Shoji, Tadao, to Eisai Co., Ltd. Theophylline derivatives. 4,599,414, Cl. 544-267.000.
Sugimoto, Hachiro: *See—*
Kaneko, Takeru; Ozaki, Satoru; Takizawa, Kimie; and Sugimoto, Hachiro, 4,599,337, Cl. 514-265.000.
Sugita, Hiroshi: *See—*
Hiramitsu, Tetsushi; Sugita, Hiroshi; and Ono, Satoshi, 4,598,603, Cl. 74-484.00R.
Sugiuchi, Masami; Miyamura, Masataka; Imai, Atsuo; and Matake, Shigeru, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrochromic display device. 4,598,979, Cl. 350-357.000.
Sugiyama, Eiji: *See—*
Kanai, Yasunori; Sugiyama, Eiji; and Nawata, Kazumasa, 4,599,521, Cl. 307-455.000.
Sugiyama, Tomohiro: *See—*
Hirota, Toshio; Tajima, Hiroyuki; and Sugiyama, Tomohiro, 4,599,282, Cl. 429-26.000.
Sumitani, Sinya: *See—*
Ohmori, Toshihiko; Sumitani, Sinya; Tani, Takio; Miyaki, Masahiko; and Masuda, Akira, 4,598,683, Cl. 123-450.000.
Sumitomo Chemical Company, Limited: *See—*
Nagano, Eiki; and Yoshida, Ryo, 4,599,104, Cl. 71-92.000.
Sumitomo Kinzoku Kogyo Kabushiki Kaisha: *See—*
Kamei, Mitsuhito; Nemoto, Shin; and Ishimoto, Souji, 4,598,998, Cl. 356-237.000.
Summit Corporation of America: *See—*
Rabotski, John, 4,598,446, Cl. 29-34.00R.
SumX Corporation: *See—*
DeBerry, David W.; and Viehbeck, Alfred, 4,599,614, Cl. 340-785.000.
Sunaga, Yasumasa: *See—*
Doi, Yoshikazu; Miyano, Hitoshi; Kishikawa, Toshiro; and Sunaga, Yasumasa, 4,598,980, Cl. 350-445.000.
Sundstrand Corporation: *See—*
Mokadam, Raghunath G., 4,598,556, Cl. 62-117.000.
Niggemann, Richard E., 4,598,695, Cl. 126-433.000.
Weber, Kent, 4,598,552, Cl. 60-673.000.
Sung, Rodney L.: *See—*
Davis, Marshall E.; and Sung, Rodney L., 4,599,088, Cl. 44-51.000.
Sunvic Regler GmbH: *See—*
Dombrowski, Ferdinand; and Forster, Dieter, 4,598,584, Cl. 73-308.000.
Super Tool Co., Ltd.: *See—*
Iseki, Seiichi, 4,598,452, Cl. 29-237.000.
Surie, Serge; and Marcel, Francois, to Compagnie Industrielle des Telecommunication Cit-Alcatel. Timing recovery circuit for synchronous data transmission using combination of L Bi phase and modified biphase codes. 4,599,735, Cl. 375-54.000.
Suter, William L. Apparatus for protecting a portion of the exterior of an aircraft. 4,598,883, Cl. 244-1.00R.
Suyama, Tadakazu: *See—*
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; and Suyama, Tadakazu, 4,599,343, Cl. 514-299.000.
Suzuki, Katsunori: *See—*
Hombu, Mitsuyuki; Ueda, Shigeta; Suzuki, Katsunori; and Matsuda, Yasuo, 4,599,685, Cl. 363-41.000.
Suzuki, Nobukazu; and Tsuruta, Shinji, to Kabushiki Kaisha Toshiba. Oxygen permeable membrane. 4,599,157, Cl. 204-192.0SP.
Suzuki, Shoji: *See—*
Uesugi, Naomoto; and Suzuki, Shoji, 4,598,790, Cl. 181-252.000.
Suzuki, Shuichi; Wada, Moriyasu; and Hayase, Shuzi, to Kabushiki Kaisha Toshiba. Resin composition. 4,599,155, Cl. 522-8.000.
Suzuki, Takeshi: *See—*
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Nakamoto, Kouji; Kajiwara, Akiharu; Katayama, Kouichi; Tsunoda, Hajime; Murakami, Manabu; Ono, Hideki; and Yamada, Kouji, 4,599,328, Cl. 514-106.000.
Suzuki, Yasuo: *See—*
Fujimaki, Yoshihide; Takei, Yoshiaki; Suzuki, Yasuo; and Nomori, Hiroyuki, 4,599,287, Cl. 430-59.000.
Suzuki, Yoshiharu: *See—*
Komoda, Yoshiyuki; Fukagawa, Hitoshi; Suzuki, Yoshiharu; and Tanaka, Osamu, 4,599,598, Cl. 340-310.00A.
Swift, Gregory W.: *See—*
Wheatley, John C.; Swift, Gregory W.; and Migliori, Albert, 4,599,551, Cl. 322-2.00R.
Swinderman, Robert T., to Martin Engineering Company. Conveyor belt cleaner. 4,598,823, Cl. 198-497.000.
Swingline Inc.: *See—*
Olesen, Paul, 4,598,852, Cl. 227-119.000.
Symtron Corporation: *See—*
Elsbree, Charles N., Jr.; and Kuhne, Werner, 4,598,471, Cl. 29-845.000.

Syntex (U.S.A.) Inc.: *See—*
Schreiber, Alain B.; Kowalski, William J.; and Unger, Stefan H., 4,599,331, Cl. 514-179.000.

Szejtli, Jozsef: *See—*
Nogradi, Mihaly; Korbonits, Dezso ; Gottsegen, Agnes; Antus, Sandor; Furst, Zsuzsa; Knoll, Jozsef; Szejtli, Jozsef; Stadler, Agnes; Kovacs, Gabor; and Marmarosi, Katalin, 4,599,327, Cl. 514-58.000.

Szelenyi, Istvan: *See—*
Schickaneder, Helmut; Postius, Stefan; Herter, Rolf; Morsdorf, Peter; Szelenyi, Istvan; and Ahrens, Kurt H., 4,599,346, Cl. 514-317.000.

Szomor nee Wundele, Maria: *See—*
Gonczi, Csaba; Korbonits, Dezso ; Palosi, Endre; Kiss, Pal; Heja, Gergely; Kun, Judit; Szomor nee Wundele, Maria; Szvoboda nee Kanzel, Ida; Marvanyos, Ede; Horvath, Karoly; Kovacs nee Mindler, Vera; and Nagy nee Koranyi, Livia, 4,599,428, Cl. 548-306.000.

Szonntagh, Eugene L.: *See—*
Barnes, David A.; and Szonntagh, Eugene L., 4,599,095, Cl. 55-208.000.

Szvoboda nee Kanzel, Ida: *See—*
Gonczi, Csaba; Korbonits, Dezso ; Palosi, Endre; Kiss, Pal; Heja, Gergely; Kun, Judit; Szomor nee Wundele, Maria; Szvoboda nee Kanzel, Ida; Marvanyos, Ede; Horvath, Karoly; Kovacs nee Mindler, Vera; and Nagy nee Koranyi, Livia, 4,599,428, Cl. 548-306.000.

Tabacchi, Vittorio; and Viel, Vincenzo. Metal frame for eyeglasses. 4,598,983, Cl. 351-95.000.

Tachibana, Chijyo: *See—*
Makabe, Hachiro; Koide, Akio; Tachibana, Chijyo; and Yamamoto, Kazuji, 4,598,657, Cl. 112-275.000.

Tachibana, Hajime: *See—*
Nakatani, Kiyoshi; Numata, Satoshi; Inoue, Tsuneo; Hosono, Akira; Oda, Kengo; Kubota, Yutaka; Tachibana, Hajime; Udagawa, Takatoshi; and Gohbara, Masatoshi, 4,599,362, Cl. 514-721.000.

Tada, Akira; and Tanigawa, Koichi, to O-M Limited. Method for folding jacket material for disk or the like. 4,599,080, Cl. 493-267.000.

Taguchi, Toshio: *See—*
Hamaguchi, Masami; Taguchi, Toshio; Nozawa, Takamitsu; and Ogawa, Riichi, 4,598,865, Cl. 239-342.000.

Tajima, Hiroyuki: *See—*
Hirota, Toshio; Tajima, Hiroyuki; and Sugiyama, Tomohiro, 4,599,282, Cl. 429-26.000.

Takacs, Mark A.: *See—*
Araps, Constance J.; Kandetzke, Steven M.; Kutner, Ellen L.; and Takacs, Mark A., 4,599,136, Cl. 156-643.000.

Takada, Hiroyuki: *See—*
Kumagai, Naotake; Tatemoto, Minoru; Takizawa, Shozo; Takada, Hiroyuki; and Harara, Mitsuhiko, 4,598,929, Cl. 280-707.000.

Takagaki, Ichiro, to Kabushiki Kaisha Sanwa Jidoki Seisakusho. Lateral sealer device for vertical packaging machine. 4,598,533, Cl. 53-552.000.

Takahara, Michiyoshi: *See—*
Kurata, Hidenori; and Takahara, Michiyoshi, 4,598,602, Cl. 74-484.00R.

Takahashi, Kihei, to Yoshida Kogyo K. K. Apparatus for dimensioning slide fastener coupling elements. 4,599,065, Cl. 425-394.000.

Takahashi, Masatoshi: *See—*
Yokono, Shigeru; Takahashi, Masatoshi; and Sato, Hideo, 4,599,076, Cl. 445-24.000.

Takahashi, Shinichiro: *See—*
Saito, Etsuro; Takahashi, Shinichiro; Yuasa, Masami; and Akiyama, Tsutomu, 4,599,663, Cl. 360-97.000.

Takahashi, Tadashi; Miyashita, Kunio; and Hayashida, Hiroshi, to Hitachi, Ltd. Device for detecting the relative and absolute position of a moving body. 4,599,561, Cl. 324-208.000.

Takahashi, Toshio, to Fuji Jukogyo Kabushiki Kaisha. System for diagnosing an internal combustion engine. 4,599,696, Cl. 364-431.110.

Takano, Hiroshi: *See—*
Shirai, Shoji; Yamauchi, Masaaki; Iidaka, Yoshiaki; Takano, Hiroshi; and Fukushima, Masakazu, 4,599,534, Cl. 313-414.000.

Takara Co., Ltd.: *See—*
Obara, Hiroyuki, 4,599,078, Cl. 446-95.000.

Takayama, Nobutoshi: *See—*
Kozuki, Susumu; Takimoto, Hiroyuki; Edakubo, Hiroo; and Takayama, Nobutoshi, 4,599,660, Cl. 360-77.000.

Takayama, Tsutomu: *See—*
Kinoshita, Takao; Tojo, Akihiko; Takayama, Tsutomu; Kaji, Toshio; and Tanaka, Nobuyoshi, 4,599,657, Cl. 358-335.000.

Takeda, Masashi: *See—*
Sekino, Takeo; and Takeda, Masashi, 4,599,599, Cl. 340-347.0AD.

Takei, Yoshiaki: *See—*
Fujimaki, Yoshihide; Takei, Yoshiaki; Suzuki, Yasuo; and Nomori, Hiroyuki, 4,599,287, Cl. 430-59.000.

Takekoshi, Tohru; and Anderson, Patricia P., to General Electric Company. Crystalline polyetherimides and polyamic acid precursors therefor. 4,599,396, Cl. 528-185.000.

Takemoto, Iwao: *See—*
Miyao, Masanobu; Ohkura, Makoto; Takemoto, Iwao; and Tamura, Masao, 4,599,133, Cl. 156-617.00R.

Takemura, Yasuhiko: *See—*
Sato, Hozumi; Iwanaga, Shin-ichiro; Enyo, Hiroji; Takemura, Yasuhiko; and Kawamura, Yoshiaki, 4,599,382, Cl. 525-139.000.

Takenoya, Hideaki, to Janome Sewing Machine Co. Ltd. Driving device of an embroidery frame in a zigzag sewing machine. 4,598,655, Cl. 112-103.000.

Takeuchi, Masaru: *See—*
Yoshida, Isao; Okabe, Takeaki; Ochi, Shikayuki; Ito, Hidefumi; Furumi, Masatomo; Takeuchi, Masaru; and Nagata, Minoru, 4,599,576, Cl. 330-264.000.

Takezaki, Takayuki: *See—*
Yasuda, Kikuo; Takezaki, Takayuki; Ohuchi, Rikio; Ohuyabu, Hiroshi; Tanimoto, Yoshitaka; Seki, Toshimi; Yamaguchi, Takashi; Izumi, Akihiro; Himori, Norio; and Ishimori, Tsutomu, 4,599,333, Cl. 514-247.000.

Takihara, Yukio, to Hosiden Electronics Co., Ltd. Internally split type jack. 4,598,970, Cl. 339-183.000.

Takimoto, Hiroyuki: *See—*
Kozuki, Susumu; Takimoto, Hiroyuki; Edakubo, Hiroo; and Takayama, Nobutoshi, 4,599,660, Cl. 360-77.000.

Takimoto, Masahiro; Ota, Satoshi; and Yamazaki, Yoshio, to Toyoda Gosei Kabushiki Kaisha. Polyvinyl chloride composition. 4,599,376, Cl. 524-441.000.

Takizawa, Kimie: *See—*
Kaneko, Takeru; Ozaki, Satoru; Takizawa, Kimie; and Sugimoto, Hachiro, 4,599,337, Cl. 514-265.000.

Takizawa, Shozo: *See—*
Kumagai, Naotake; Tatemoto, Minoru; Takizawa, Shozo; Takada, Hiroyuki; and Harara, Mitsuhiko, 4,598,929, Cl. 280-707.000.

Tamai, Mamoru: *See—*
Kamisaka, Makoto; Okamoto, Toshiro; Ohshima, Michio; and Tamai, Mamoru, 4,599,478, Cl. 585-648.000.

Tamaru, Akio; Izumisawa, Yoshiaki; Hashimoto, Hidekichi; Kuma, Kiyoji; Komaya, Takashi; and Minagawa, Masanobu, to Mitsubishi Chemical Industries, Ltd. Process for producing orthoalkylphenols. 4,599,465, Cl. 568-781.000.

Tamatoshi Industries Ltd.: *See—*
Itagaki, Takafumi, 4,598,504, Cl. 52-36.000.

Tamm, Ulf S. Apparatus for measuring pulse rate and pulmonary volume. 4,598,700, Cl. 128-671.000.

Tamura, Masao: *See—*
Miyao, Masanobu; Ohkura, Makoto; Takemoto, Iwao; and Tamura, Masao, 4,599,133, Cl. 156-617.00R.

Tan, Chuan-Chieh; Slack, Thomas B.; and Denenberg, Jeffrey N., to ITT Corporation. Probabilistic learning element employing context drive searching. 4,599,692, Cl. 364-513.000.

Tanabe, Takeo: *See—*
Hayashi, Saburo; Mukai, Mitsukazu; Inoue, Masahiro; Tsuchiya, Hiroo; Otsuji, Akira; and Tanabe, Takeo, 4,599,177, Cl. 210-718.000.

Tanabe, Yoshio: *See—*
Iwasaki, Yoshitaka; Mori, Kunio; and Tanabe, Yoshio, 4,598,780, Cl. 177-3.000.

Tanaka, Akira; Miura, Hidetoshi; and Koga, Masao, to Mitsubishi Paper Mills, Ltd. Direct positive silver halide photographic emulsions. 4,599,300, Cl. 430-411.000.

Tanaka, Fuminari: *See—*
Matsuo, Kenji; and Tanaka, Fuminari, 4,599,522, Cl. 307-576.000.

Tanaka, Hideo: *See—*
Torii, Sigeru; Tanaka, Hideo; Sasaoka, Michio; Shiroi, Takashi; and Uto, Seiryu, 4,599,151, Cl. 204-59.00R.

Tanaka, Kunihiko: *See—*
Kamiya, Takashi; Tanaka, Kunihiko; Teraji, Tsutomu; and Nakai, Yoshiharu, 4,599,426, Cl. 548-195.000.

Tanaka, Masaaki: *See—*
Naito, Mitikatu; Yano, Kiyotosi; Itou, Kazuo; Tsuzuki, Kunihiro; Tanaka, Masaaki; and Kawagoe, Michio, 4,598,729, Cl. 137-116.500.

Tanaka, Mitsuhiro: *See—*
Hayashi, Akira; Hirota, Yutaka; and Tanaka, Mitsuhiro, 4,599,275, Cl. 428-461.000.

Tanaka, Nobuyoshi: *See—*
Kinoshita, Takao; Tojo, Akihiko; Takayama, Tsutomu; Kaji, Toshio; and Tanaka, Nobuyoshi, 4,599,657, Cl. 358-335.000.

Tanaka, Osamu: *See—*
Komoda, Yoshiyuki; Fukagawa, Hitoshi; Suzuki, Yoshiharu; and Tanaka, Osamu, 4,599,598, Cl. 340-310.00A.

Tanaka, Takashi; and Abe, Shigeru, to Toshiba Ceramics Co., Ltd. Silicon carbide process tube for semiconductor wafers. 4,598,665, Cl. 118-715.000.

Tanaka, Yasuo: *See—*
Shimozono, Ryoji; Ogawa, Yasunori; Tanaka, Yasuo; and Sano, Shigeo, 4,599,583, Cl. 332-9.00R.

Tani, Takio: *See—*
Ohmori, Toshihiko; Sumitani, Sinya; Tani, Takio; Miyaki, Masahiko; and Masuda, Akira, 4,598,683, Cl. 123-450.000.

Tanigawa, Koichi: *See—*
Tada, Akira; and Tanigawa, Koichi, 4,599,080, Cl. 493-267.000.

Tanimoto, Yoshitaka: *See—*
Yasuda, Kikuo; Takezaki, Takayuki; Ohuchi, Rikio; Ohuyabu, Hiroshi; Tanimoto, Yoshitaka; Seki, Toshimi; Yamaguchi, Takashi; Izumi, Akihiro; Himori, Norio; and Ishimori, Tsutomu, 4,599,333, Cl. 514-247.000.

Tanimura, Masatake: *See—*
Ando, Masao; and Tanimura, Masatake, 4,599,115, Cl. 127-46.100.

Taniuchi, Tetsuo, to Matsushita Electric Industrial Co., Ltd. Temperature detector. 4,598,996, Cl. 356-43.000.

Tanney, John W.: *See*—
Robinson, Barton R.; and Tanney, John W., 4,598,578, Cl. 73-32.00R.
Tarbuck, Robert R., to Sperry Corporation. Positive registration compliant apparatus for robotic assemblers. 4,599,036, Cl. 414-730.000.
Tashiro, Hidenori; and Watanabe, Minoru, to Kabushiki Kaisha Murakoshi Seiko. Article-joining device. 4,599,011, Cl. 403-407.100.
Tashiro, Hidetaka: *See*—
Numazawa, Masaaki; and Tashiro, Hidetaka, 4,598,697, Cl. 128-1.00D.
Tate, Bernell G. Adjustable wrench. 4,598,615, Cl. 81-64.000.
Tate, John M.: *See*—
Widner, Rayburn K.; and Tate, John M., 4,598,597, Cl. 73-864.410.
Tatemoto, Minoru: *See*—
Kumagai, Naotake; Tatemoto, Minoru; Takizawa, Shozo; Takada, Hiroyuki; and Harara, Mitsuhiko, 4,598,929, Cl. 280-707.000.
Taya, Shunroku; Koike, Takeshi; and Komatsu, Mitsuo, to Hitachi, Ltd. Specimens rotating device. 4,599,516, Cl. 250-443.100.
Taylor, Paul R., to Dover Corporation. Method and apparatus for monitoring liquid stock in a storage tank. 4,598,742, Cl. 141-95.000.
TBS International, Inc.: *See*—
Cave, Ellis K., 4,599,493, Cl. 179-18.0FH.
TDK Corporation: *See*—
Izumi, Toshiaki; Noguchi, Kiyoshi; and Kohmoto, Misao, 4,599,280, Cl. 428-694.000.
Nakayama, Masatoshi; Morita, Haruyuki; Tokuoka, Yasumichi; Izumi, Toshiaki; Fukuda, Kazumasa; and Kubota, Yuichi, 4,599,266, Cl. 428-336.000.
TDK Electronics Co., Ltd.: *See*—
Nakagawa, Shiro; Kuroiwa, Akihiko; and Nanba, Kenryo, 4,599,718, Cl. 369-100.000.
Technische Gerate-u.Entwicklungsgesellschaft m.b.H.: *See*—
Jordan, Heinz, 4,598,887, Cl. 244-17.110.
Teikoku Hormone Mfg. Co., Ltd.: *See*—
Yasuda, Kikuo; Takezaki, Takayuki; Ohuchi, Rikio; Ohuyabu, Hiroshi; Tanimoto, Yoshitaka; Seki, Toshimi; Yamaguchi, Takashi; Izumi, Akihiro; Himori, Norio; and Ishimori, Tsutomu, 4,599,333, Cl. 514-247.000.
Tektronix, Inc.: *See*—
Murray, Donald F., 4,599,721, Cl. 370-112.000.
Wilke, William G., 4,598,575, Cl. 73-5.000.
Teledyne Industries, Inc.: *See*—
Cammack, Michael A.; and Smith, David W., 4,598,866, Cl. 239-447.000.
Tellbach, Reinhard: *See*—
Blank, Wilhelm; Roth, Ernst; and Tellbach, Reinhard, 4,599,487, Cl. 174-151.000.
Telle, John M., to United States of America, Energy. Apparatus and method for generating continuous wave 16 μm laser radiation using gaseous CF_4. 4,599,726, Cl. 372-4.000.
Temkin, Henryk: *See*—
Alavi, Kambiz; Cho, Alfred Y.; Pearsall, Thomas P.; and Temkin, Henryk, 4,599,728, Cl. 372-45.000.
Temporal Dynamics Research, Inc.: *See*—
Ritter, David W., 4,598,789, Cl. 181-144.000.
Tenne, Moses. Multi-shell heat exchanger. 4,598,768, Cl. 165-165.000.
Terada, Atsusuke: *See*—
Fukami, Masaharu; Terada, Atsusuke; and Hasegawa, Kazue, 4,599,360, Cl. 514-570.000.
Teraji, Tsutomu: *See*—
Kamiya, Takashi; Tanaka, Kunihiko; Teraji, Tsutomu; and Nakai, Yoshiharu, 4,599,426, Cl. 548-195.000.
Teramachi, Hiroshi. Cross-linear slide bearing unit. 4,598,956, Cl. 384-45.000.
Teraoka Seiko Co., Ltd.: *See*—
Iwasaki, Yoshitaka; Mori, Kunio; and Tanabe, Yoshio, 4,598,780, Cl. 177-3.000.
Terasaki, Paul I.; and Aoki, Dennis, to University of California Regents. Microdroplet test apparatus. 4,599,315, Cl. 435-301.000.
Terasawa, Koji; Miyakawa, Akira; and Kiyohara, Takehiko, to Canon Kabushiki Kaisha. Ink tank frangible lever for pressure co-action with a ink bag. 4,599,625, Cl. 346-140.00R.
Terumo Corporation: *See*—
Kanno, Michio; and Nogawa, Atsuhiko, 4,598,733, Cl. 137-406.000.
Texaco Inc.: *See*—
Cox, Percy T.; and Warren, Wayne F., 4,599,566, Cl. 324-341.000.
Davis, Marshall E.; and Sung, Rodney L., 4,599,088, Cl. 44-51.000.
Slough, Carlton M., 4,599,045, Cl. 417-44.000.
Texas Instruments Incorporated: *See*—
Bean, Kenneth E.; Havemann, Robert H.; and Lane, Andrew, 4,599,247, Cl. 427-93.000.
Breit, Henry F., 4,598,473, Cl. 29-855.000.
Hynecek, Jaroslav, 4,599,639, Cl. 357-23.130.
Texet Corportion: *See*—
Jaycox, Jeffrey M.; and Pitzer, Dorman C., 4,599,554, Cl. 323-317.000.
Theissen, Robert J., to Rhone-Poulenc, Inc. (Bisalkoxycarbonyl)alkyl 5-[2-chloro-4-(trifluoromethyl)phenoxy]-2-nitrobenzoates. 4,599,442, Cl. 560-21.000.
Thermal Concepts, Inc.: *See*—
Bingham, Grady A., 4,598,558, Cl. 62-324.100.
Thiele, Karl O.; and Toth, Steven L., to Enertronics, Inc. Power cell assembly. 4,599,283, Cl. 429-99.000.
Thioux, Alain, to Societe Anonyme D.B.A. Multi-disc brake. 4,598,799, Cl. 188-71.500.
Thirant, Lydie: *See*—
Mourey, Bruno; Hareng, Michel; and Thirant, Lydie, 4,598,978, Cl. 350-351.000.
Thire, Jacques; and Souques, Georges, to La Telemecanique Electrique. Integrated self-firing amplified thyristor structure for on/off switching of high currents and control circuit thereof. 4,599,633, Cl. 357-38.000.
Thoma, Martin; and Bunger, Paul, to MTU Motoren-und Turbinen-Union Muenchen GmbH. Galvanically deposited dispersion layer and method for making such layer. 4,599,148, Cl. 204-16.000.
Thomas, John E.: *See*—
Anglin, Jeanne M.; Edwards, Richard R.; and Thomas, John E., 4,599,255, Cl. 428-73.000.
Thomas, Richard H., to Marquip, Inc. Shingling and stacking of conveyed sheet material with pre-shingling control of sheet feed. 4,598,901, Cl. 271-202.000.
Thomas, Rudolf; Eue, Ludwig; Schmidt, Robert; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Novel N-(1-alkenyl)-chloroacetanilides as herbicides and plant growth regulators. 4,599,448, Cl. 564-214.000.
Thompson, James R.; Armstrong, Errol C.; Wipfler, Richard T.; and Rhodes, Richard O., to FAFCO, Inc. Method for fabricating a solar energy collector assembly utilizing a specifically designed fluid storage arrangement. 4,598,450, Cl. 29-157.30V.
Thompson, Jerome B. Cellulose food product and products resulting therefrom. 4,599,240, Cl. 426-634.000.
Thompson, Robert W.: *See*—
Alkire, Gerald R.; Frank, Woodrow W., Jr.; and Thompson, Robert W., 4,598,580, Cl. 73-104.000.
Thompson, Ronald J., to Federal-Mogul Corporation. Method for making improved split bearings having masked relief areas. 4,599,147, Cl. 204-15.000.
Thomson CSF: *See*—
Mourey, Bruno; Hareng, Michel; and Thirant, Lydie, 4,598,978, Cl. 350-351.000.
Nollet, Michel, 4,599,577, Cl. 330-290.000.
Thorn EMI Domestic Appliances Limited: *See*—
Barnett, Edward C. W., 4,598,874, Cl. 241-37.500.
Tiitto, Seppo I.; and Mielityinen-Tiitto, Kirsti I., to American Stress Technologies, Inc. Barkhausen noise method for analyzing the anisotropic properties of ferromagnetic steel. 4,599,563, Cl. 324-232.000.
Tilley, Jefferson W.: *See*—
Carson, Matthew; Le Mahieu, Ronald A.; Nason, William C.; and Tilley, Jefferson W., 4,599,336, Cl. 514-259.000.
Tinti, Maria O., to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. Process for preparing L-norcarnitine hydrochloride. 4,599,447, Cl. 562-567.000.
Tippen, Lesley Jerry: *See*—
Tippen, Lesley T., 4,598,783, Cl. 180-9.320.
Tippen, Lesley T., to Tippen, Lesley Jerry; Young, Bettie Tippen; Schooley, Sharon Tippen; and Carter, Lisa Tippen, part interest to each. Traction device for vehicles. 4,598,783, Cl. 180-9.320.
Tischer, Werner: *See*—
Schulte, Bernhard; Tischer, Werner; Kaloff, Hans; and Weber, Hans-Leo, 4,599,262, Cl. 428-215.000.
TMC Corporation: *See*—
Hoelzl, Klaus, 4,598,933, Cl. 280-809.000.
Konwitza, Vladimir, 4,598,928, Cl. 280-618.000.
Toch, Peter L., to Raytheon Company. Display tube output assembly and method of manufacture. 4,599,535, Cl. 313-478.000.
Toei, Keiji: *See*—
Kondo, Syuzi; Yamano, Akira; and Toei, Keiji, 4,599,295, Cl. 430-156.000.
Toga, Yuzo; Okamoto, Ichiro; and Kanno, Tatsuya, to Daicel Chemical Industries, Ltd. Polyalkylene ether glycol copolymers. 4,599,460, Cl. 568-617.000.
Tojo, Akihiko: *See*—
Kinoshita, Takao; Tojo, Akihiko; Takayama, Tsutomu; Kaji, Toshio; and Tanaka, Nobuyoshi, 4,599,657, Cl. 358-335.000.
Tokai Shoji Co. Ltd.: *See*—
Shirataki, Kenji, 4,599,248, Cl. 427-209.000.
Tokumitsu, Shigenori, to Tokyo Shibaura Denki Kabushiki Kaisha. Divider circuit for dividing n-bit binary data using decimal shifting and summation techniques. 4,599,702, Cl. 364-764.000.
Tokunaga, Tadatsugu: *See*—
Fujii, Akira; Tokunaga, Tadatsugu; and Adachi, Hiroaki, 4,599,648, Cl. 358-124.000.
Tokuoka, Yasumichi: *See*—
Nakayama, Masatoshi; Morita, Haruyuki; Tokuoka, Yasumichi; Izumi, Toshiaki; Fukuda, Kazumasa; and Kubota, Yuichi, 4,599,266, Cl. 428-336.000.
Tokyo Electric Co., Ltd.: *See*—
Saito, Shunji, 4,599,659, Cl. 360-75.000.
Tsuge, Takeyoshi; Torisawa, Yoshihiro; Makino, Ayumu; and Kimura, Tsutomu, deceased, 4,599,629, Cl. 346-140.00R.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Hosoya, Masahiro; Uehara, Tsutomu; and Nosaki, Takefumi, 4,598,991, Cl. 355-3.0DD.
Kikuchi, Katsuya; and Honda, Michitaka, 4,599,742, Cl. 378-099.000.
Kon, Takao, 4,599,637, Cl. 357-30.000.
Matsuo, Kenji; and Tanaka, Fuminari, 4,599,522, Cl. 307-576.000.
Sugiuchi, Masami; Miyamura, Masataka; Imai, Atsuo; and Matake, Shigeru, 4,598,979, Cl. 350-357.000.
Tokumitsu, Shigenori, 4,599,702, Cl. 364-764.000.
Tsuzuki, Mitsuo, 4,599,631, Cl. 357-13.000.

Tolliver, Wilbur E. Reinforcement support spacer. 4,598,523, Cl. 52-685.000.

Tomalia, Donald A.; and Hall, Mark J., to Dow Chemical Company, The. Star/comb-branched polyamide. 4,599,400, Cl. 528-405.000.

Tomayko, Edward A.; and Pandeya, Prakash N., to Carrier Corporation. Reversible fixed vane rotary compressor having a reversing disk which carries the suction port. 4,598,559, Cl. 62-324.600.

Tomchak, Sigfrid A.: *See—*
Padilla, James M.; and Tomchak, Sigfrid A., 4,599,171, Cl. 210-257.200.

Tomlinson, William M.: *See—*
Gibson, William C.; Tomlinson, William M.; Goldstein, Eugene T.; and Ferguson, George A., 4,599,680, Cl. 361-386.000.

Tomosada, Masahiro; Maeshima, Katsuyoshi; Inuzuka, Tsuneki; and Sakamaki, Hisashi, to Canon Kabushiki Kaisha. Image formation apparatus capable of different image magnification. 4,598,994, Cl. 355-14.00R.

Tomozawa, Shigeo, to Nankai Tekko Co., Ltd. Coaster brake. 4,598,805, Cl. 192-6.00R.

Tong, Chun H.: *See—*
Liu, Jeffrey; and Tong, Chun H., 4,599,666, Cl. 360-106.000.

Torii, Sigeru; Tanaka, Hideo; Sasaoka, Michio; Shiroi, Takashi; and Uto, Seiryu, to Otsuka Kagaku Kabushiki Kaisha. Process for preparing 2,2-bishalomethylpenam derivatives. 4,599,151, Cl. 204-59.00R.

Torisawa, Yoshihiro: *See—*
Tsuge, Takeyoshi; Torisawa, Yoshihiro; Makino, Ayumu; and Kimura, Tsutomu, deceased, 4,599,629, Cl. 346-140.00R.

Toriumi, Mototada: *See—*
Mizutani, Morikazu; Onoda, Shigeyoshi; Nomura, Akihiro; Kanemitsu, Shinji; and Toriumi, Mototada, 4,598,993, Cl. 355-3.00R.

Toshiba Ceramics Co., Ltd.: *See—*
Tanaka, Takashi; and Abe, Shigeru, 4,598,665, Cl. 118-715.000.

Toshiba Silicone Co., Ltd.: *See—*
Watanabe, Junichiro; and Funahashi, Yuichi, 4,599,440, Cl. 556-460.000.

Toth, Steven L.: *See—*
Thiele, Karl O.; and Toth, Steven L., 4,599,283, Cl. 429-99.000.

Towers, James A.; and Krueger, Robert H., to Borg-Warner Corporation. Refrigerant additive and method for reducing corrosion in refrigeration systems. 4,599,185, Cl. 252-68.000.

Toyoda Gosei Co., Ltd.: *See—*
Hiramitsu, Tetsushi; Sugita, Hiroshi; and Ono, Satoshi, 4,598,603, Cl. 74-484.00R.

Toyoda Gosei Kabushiki Kaisha: *See—*
Takimoto, Masahiro; Ota, Satoshi; and Yamazaki, Yoshio, 4,599,376, Cl. 524-441.000.

Toyota Jidosha Kabushiki Kaisha: *See—*
Ikemoto, Kazuhito, 4,598,599, Cl. 74-411.500.
Kobayashi, Nobuyuki; and Ito, Toshimitsu, 4,598,678, Cl. 123-306.000.
Nono, Yasushi; and Sasaki, Yoshio, 4,598,674, Cl. 123-90.410.
Numazawa, Akio; Nakamura, Keiichi; and Sakai, Toshifumi, 4,599,051, Cl. 417-293.000.
Yamamoto, Masami; Sekiyama, Kenichi; and Kuwayama, Kiyoaki, 4,598,900, Cl. 267-52.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Naito, Mitikatu; Yano, Kiyotosi; Itou, Kazuo; Tsuzuki, Kunihiro; Tanaka, Masaaki; and Kawagoe, Michio, 4,598,729, Cl. 137-116.500.

Trachte, Dietrich, to Robert Bosch GmbH. Fuel injection nozzle for internal combustion engines. 4,598,867, Cl. 239-453.000.

Trammell, David R.: *See—*
Lewis, Leroy C.; and Trammell, David R., 4,599,517, Cl. 250-506.100.

Tramposch, Herbert, to Pitney Bowes Inc. Load cell having a flexure connector. 4,598,781, Cl. 177-211.000.

Trayco, Inc.: *See—*
Whitney, Thomas H., 4,598,433, Cl. 4-607.000.

Tremix AB: *See—*
Alvarsson, Yngve, 4,598,517, Cl. 52-364.000.

Trend, John E.: *See—*
Eian, Gilbert L.; and Trend, John E., 4,599,273, Cl. 428-412.000.

Troiano, Anthony, to RCA Corporation. Brightness control apparatus for a video signal processing system. 4,599,641, Cl. 358-39.000.

Troiano, Anthony: *See—*
Truskalo, Walter; and Troiano, Anthony, 4,599,673, Cl. 361-150.000.

Tronich, Gunter; and Schmid, Martin, to Steinbock GmbH. Shaft-steered conveyor appliance. 4,598,784, Cl. 180-19.200.

Troster, Helmut: *See—*
Spietschka, Ernst; and Troster, Helmut, 4,599,408, Cl. 544-125.000.

Truskalo, Walter; and Troiano, Anthony, to RCA Corporation. Degaussing system arrangements. 4,599,673, Cl. 361-150.000.

Truskolaski, Bernard S.; and Pohl, Daniel P., to Minnesota Mining and Manufacturing Company. Directly printable tape with novel release coating. 4,599,260, Cl. 428-207.000.

TRW Inc.: *See—*
Drutchas, Gilbert H., 4,598,787, Cl. 180-79.100.
Skrocki, Roger R., 4,598,643, Cl. 102-307.000.

Tsang, Won-Tien: *See—*
Bethea, Clyde G.; Capasso, Federico; Hutchinson, Albert L.; Levine, Barry F.; and Tsang, Won-Tien, 4,599,632, Cl. 357-30.000.

Tsarnikavsky Rybolovetsky Kolkhoz "Tsarnikava" : *See—*
Eglais, Aldis O., 4,598,658, Cl. 114-39.000.

Tsironis, Christos, to U.S. Philips Corporation. Temperature stabilizing microwave oscillator circuit. 4,599,581, Cl. 331-66.000.

Tsuchiya, Hiroo: *See—*
Hayashi, Saburo; Mukai, Mitsukazu; Inoue, Masahiro; Tsuchiya, Hiroo; Otsuji, Akira; and Tanabe, Takeo, 4,599,177, Cl. 210-718.000.

Tsuda, Yoshio: *See—*
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; and Suyama, Tadakazu, 4,599,343, Cl. 514-299.000.

Tsuge, Takeyoshi; Torisawa, Yoshihiro; Makino, Ayumu; and Kimura, Tsutomu, deceased (by Kimura, Shizuko, legal representative), to Tokyo Electric Co., Ltd. Magnetic ink dot printer with means for controlling print density. 4,599,629, Cl. 346-140.00R.

Tsuji, Toshihide; Ioka, Yoshinori; Anzai, Hisatugu; Kasahara, Noboru; and Katagiri, Fujio, to Ryobi Ltd.; and Hochiki Corporation. Apparatus for closing fireproof doors. 4,598,494, Cl. 49-2.000.

Tsukamoto, Mamoru: *See—*
Saitoh, Hiroshi; Kadooka, Katsuyuki; Tsukamoto, Mamoru; Ono, Shoji; and Ohkawa, Masaki, 4,599,238, Cl. 426-557.000.

Tsunekawa, Sukeyoshi; Homma, Yoshio; Morisaki, Hiroshi; Okudaira, Sadayuki; and Mukai, Kiichiro, to Hitachi, Ltd. Thin film deposition. 4,599,135, Cl. 156-643.000.

Tsunoda, Hajime: *See—*
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Nakamoto, Kouji; Kajiwara, Akiharu; Katayama, Kouichi; Tsunoda, Hajime; Murakami, Manabu; Ono, Hideki; and Yamada, Kouji, 4,599,328, Cl. 514-106.000.

Tsuruta, Shinji: *See—*
Suzuki, Nobukazu; and Tsuruta, Shinji. 4,599,157, Cl. 204-192.0SP.

Tsuzuki, Kunihiro: *See—*
Naito, Mitikatu; Yano, Kiyotosi; Itou, Kazuo; Tsuzuki, Kunihiro; Tanaka, Masaaki; and Kawagoe, Michio, 4,598,729, Cl. 137-116.500.

Tsuzuki, Mitsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor apparatus having a zener diode integral with a resistor-transistor combination. 4,599,631, Cl. 357-13.000.

Tu-Fit (Proprietary) Limited: *See—*
Hocking, Warwick P., 4,599,010, Cl. 403-191.000.

Tuchman, Samuel: *See—*
Perlov, Gena; and Tuchman, Samuel, 4,599,083, Cl. 623-3.000.

Tukala, Tommy S.: *See—*
Liljekvist, Bernt S.; Nordmark, Bo Carl G.; and Tukala, Tommy S., 4,598,779, Cl. 175-410.000.

Tumbush, Gerald L.: *See—*
Sanford, Norman R.; and Tumbush, Gerald L., 4,599,560, Cl. 324-207.000.

Turri, Eugenio: *See—*
Calamani, Sergio; and Turri, Eugenio, 4,598,656, Cl. 112-121.120.

Tzeng, Chin-Pyng J., to Rockwell International Corporation. De-glitch circuitry for video game memories. 4,599,525, Cl. 307-234.000.

Uchida, Hiroshi; and Kawarabashi, Tsukasa, to Murata Kikai Kabushiki Kaisha. Bobbin distributing device. 4,598,869, Cl. 242-35.50A.

Udagawa, Takatoshi: *See—*
Nakatani, Kiyoshi; Numata, Satoshi; Inoue, Tsuneo; Hosono, Akira; Oda, Kengo; Kubota, Yutaka; Tachibana, Hajime; Udagawa, Takatoshi; and Gohbara, Masatoshi, 4,599,362, Cl. 514-721.000.

Ueberall, Paul, to Otto Bilz, Werkzeugfabrik. Overload coupling device. 4,599,019, Cl. 408-139.000.

Ueda, Akiteru: *See—*
Mutoh, Nobuyoshi; Sakai, Keijiro; Ueda, Akiteru; Ishibashi, Akira; and Okajima, Ikuo, 4,599,549, Cl. 318-798.000.

Ueda, Shigeki, to Matsushita Electric Industrial Co., Ltd. Microwave oven having low-energy defrost and high-energy cooking modes. 4,599,503, Cl. 219-10.55B.

Ueda, Shigeta: *See—*
Hombu, Mitsuyuki; Ueda, Shigeta; Suzuki, Katsunori; and Matsuda, Yasuo, 4,599,685, Cl. 363-41.000.

Ueda, Sumio; and Fukuda, Kunio, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyphenylene ether resin composition. 4,599,380, Cl. 525-68.000.

Uehara, Tsutomu: *See—*
Hosoya, Masahiro; Uehara, Tsutomu; and Nosaki, Takefumi, 4,598,991, Cl. 355-3.0DD.

Uehara, Yoshiyuki: *See—*
Kusumoto, Hiroshi; and Uehara, Yoshiyuki, 4,598,990, Cl. 355-3.0FU.

Uemura, Keiichi, to Nippondenso Co., Ltd. Wiper device. 4,599,546, Cl. 318-443.000.

Ueno, Kouji; and Miyamura, Tamio, to Fujitsu Limited. Semiconductor memory device having switching circuit for preventing channel leakage in constant current source. 4,599,688, Cl. 365-189.000.

Ueno, Tadashi, to Shimano Industrial Company Limited. Gear crank for a bicycle. 4,598,608, Cl. 74-594.200.

Uesugi, Naomoto; and Suzuki, Shoji, to Honda Giken Kogyo Kabushiki Kaisha. Heat and sound insulation device. 4,598,790, Cl. 181-252.000.

Uhrner, Horst: *See—*
Schwing, Ewald; Sommer, Peter; and Uhrner, Horst, 4,599,067, Cl. 432-58.000.

Ukiah Machine & Welding Inc.: *See—*
McGehee, John, 4,598,916, Cl. 279-1.00M.

Ukita, Kenkichi: *See—*
Ando, Toshihiro; Nakanishi, Yutaka; and Ukita, Kenkichi, 4,599,274, Cl. 428-442.000.

Ulrich, Jorn: *See—*
Stiller, Wilfried; Ulrich, Jorn; and Sibbers, Hartwig, 4,598,721, Cl. 131-375.000.
Ulrich, Klaus: *See—*
Janssen, Wilhelm; and Ulrich, Klaus, 4,599,068, Cl. 432-97.000.
Umetsu, Shinjiro, to Nippon Electric Co., Ltd. Pager receiver comprising a memory storing a sequence of information signals to be tested. 4,599,615, Cl. 340-825.440.
Unger, Stefan H.: *See—*
Schreiber, Alain B.; Kowalski, William J.; and Unger, Stefan H., 4,599,331, Cl. 514-179.000.
Union Carbide Corporation: *See—*
Akridge, James R., 4,599,284, Cl. 429-191.000.
Billig, Ernst; Abatjoglou, Anthony G.; Bryant, David R.; Murray, Rex E.; and Mather, John M., 4,599,206, Cl. 558-85.000.
Fan, You-Ling; Brode, George L.; and Rosen, Meyer R., 4,599,390, Cl. 526-240.000.
Jarinko, Philip A.; Schuitemaker, Frans; and Bishop, Paul W., 4,598,864, Cl. 239-152.000.
Kanner, Bernard; and Lewis, Kenrick M., 4,599,441, Cl. 556-469.000.
Koleske, Joseph V., 4,599,401, Cl. 528-408.000.
Masterson, Ian F., 4,599,107, Cl. 75-59.200.
Werner, Robert G.; and Fay, Homer, 4,599,094, Cl. 55-26.000.
Union Oil Company of California: *See—*
Robinson, Paul R.; and Moorehead, Eric L., 4,599,477, Cl. 585-622.000.
Uniset Corporation: *See—*
Kopf, Rowland J., 4,598,851, Cl. 227-9.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
King, Robin C. M.; Esterson, Maurice; and Clarke, John, 4,599,542, Cl. 315-59.000.
Mullin, John B.; Holliday, Arthur K.; Cole-Hamilton, David J.; Jones, Anthony C.; and Gerrard, Neil D., 4,599,150, Cl. 204-59.0QM.
U.S. Clinical Products, Inc.: *See—*
Singletary, Winfield S., Jr., 4,598,834, Cl. 215-232.000.
United States of America
Administrator, National Aeronautics and Space Administration: *See—*
Vykukal, Hubert C., 4,598,427, Cl. 2-2.10A.
Air Force: *See—*
Barbella, Peter F.; and Wagner, Ronald A., 4,599,616, Cl. 343-7.0PF.
Brewer, G. Daniel, 4,598,543, Cl. 60-39.161.
Haupt, Randy L., 4,599,622, Cl. 343-427.000.
Weixel, Mark S., 4,598,469, Cl. 29-747.000.
Army: *See—*
Gutleber, Frank S., 4,599,733, Cl. 375-25.000.
Savioli, Giulio V., 4,598,490, Cl. 42-50.000.
Widner, Rayburn K.; and Tate, John M., 4,598,597, Cl. 73-864.410.
Energy: *See—*
Bilharz, Oscar W., 4,599,703, Cl. 364-851.000.
Boenig, Heinrich J., 4,599,519, Cl. 307-22.000.
Bushaw, Bruce A., 4,599,512, Cl. 250-253.000.
Doll, David W.; and Hager, E. Randolph, 4,598,936, Cl. 285-18.000.
Flinn, John E.; and Korth, Gary E., 4,599,060, Cl. 425-1.000.
George, E. Victor, 4,599,725, Cl. 372-3.000.
Lewis, Leroy C.; and Trammell, David R., 4,599,517, Cl. 250-506.100.
Sheen, Shuh-Haw; and Raptis, Apostolos C., 4,598,593, Cl. 73-861.040.
Telle, John M., 4,599,726, Cl. 372-4.000.
Ware, Kenneth D.; and Jones, Claude R., 4,599,731, Cl. 372-77.000.
Wheatley, John C.; Swift, Gregory W.; and Migliori, Albert, 4,599,551, Cl. 322-2.00R.
Health and Human Services: *See—*
Narayanan, Venkatachala L.; Wolpert-Defilippes, Mary K.; and Haugwitz, Rudiger D., 4,599,352, Cl. 514-492.000.
Interior: *See—*
Hanson, David R., 4,598,588, Cl. 73-584.000.
National Aeronautics and Space Administration: *See—*
Hallam, Kenneth L.; Howell, Barton J.; and Wilson, Mark E., 4,598,981, Cl. 350-505.000.
Richard, Herbert L., 4,599,001, Cl. 356-419.000.
Vykukal, Hubert C., 4,598,428, Cl. 2-2.10A.
Navy: *See—*
Baran, Robert H.; Cioccio, Armand, deceased; Komenda, Joseph G.; and Hawkins, Ronald B., 4,599,745, Cl. 455-612.000.
Cuomo, Frank W., 4,599,711, Cl. 367-141.000.
Eden, James G.; and Killeen, Kevin P., 4,599,730, Cl. 372-57.000.
Evans, Alan G., 4,599,620, Cl. 343-357.000.
Jacobson, Irwin S., 4,599,044, Cl. 417-42.000.
Lukens, William E.; and DeNale, Robert, 4,599,505, Cl. 219-74.000.
Skaalen, Clifford I.; Lange, Herman G.; and Springston, Preston S., 4,599,030, Cl. 414-460.000.
Vranish, John M.; Mitchell, Eugene; and DeMoyer, Robert, 4,598,595, Cl. 73-862.080.
U.S. Philips Corporation: *See—*
Doring, Michael; Bentin, Horst K.; and Maier, Herman F. L., 4,599,628, Cl. 346-140.00R.
McCann, Kenneth D., 4,599,579, Cl. 331-1.00R.
Meermans, Matheus J. M., 4,599,669, Cl. 360-132.000.
Pelgrom, Marcellinus J. M.; Raven, Johannes G.; Slotboom, Jan W.; Harwig, Hendrik A.; and Annegarn, Marcellinus J. J. C., 4,599,710, Cl. 365-238.000.
Seevinck, Evert, 4,599,578, Cl. 330-298.000.
Tsironis, Christos, 4,599,581, Cl. 331-66.000.
United States Steel Corporation: *See—*
Rueckl, Roger L., 4,599,142, Cl. 202-242.000.
U.S. Truck Cranes, Inc.: *See—*
Haus, John C., Jr., 4,599,032, Cl. 414-542.000.
United Technologies Automotive, Inc.: *See—*
Migrin, Robert S., 4,599,501, Cl. 200-156.000.
United Technologies Corporation: *See—*
Couch, Robert P., 4,599,568, Cl. 328-6.000.
Fischer, William C.; Adams, Don L.; Wright, Stuart C.; and Verzella, David J., 4,599,698, Cl. 364-551.000.
Knowles, William C., 4,598,600, Cl. 74-423.000.
Monhardt, Richard J.; Orr, Alfred B.; and Wright, Joseph B., 4,598,449, Cl. 29-157.00R.
Ross, Richard H., Jr.; and Longtin, Donald J., 4,599,037, Cl. 414-752.000.
Universal Manufacturing Corporation: *See—*
Rice, Ronald B.; and Kosnosky, Theodore P., 4,599,676, Cl. 361-275.000.
University of Akron, The: *See—*
Farona, Michael F.; and Kennedy, Joseph P., 4,599,384, Cl. 525-245.000.
University of Calif., The Regents of the: *See—*
Hoenninger, John C., III; Crooks, Lawrence E.; and Arakawa, Mitsuaki, 4,599,565, Cl. 324-309.000.
University of California, The Regents of the: *See—*
Witte, Owen N.; Watanabe, Susan; and Konopka, James, 4,599,305, Cl. 435-7.000.
University of California Regents: *See—*
Terasaki, Paul I.; and Aoki, Dennis, 4,599,315, Cl. 435-301.000.
University of KY Research Foundation: *See—*
Kao, David T., 4,598,630, Cl. 92-78.000.
University of Oklahoma, Board of Regents for the: *See—*
Rohrer, Michael D.; and Bulard, Ronald A., 4,599,216, Cl. 422-21.000.
University of Toronto - Innovations Foundation: *See—*
Kluger, Ronald; and Mamelak, Mortimer, 4,599,355, Cl. 514-533.000.
University of Utah: *See—*
Michl, Josef, 4,599,462, Cl. 568-702.000.
UOP Inc.: *See—*
Ward, Dennis J., 4,599,471, Cl. 585-441.000.
Uotila, Jaakko A.: *See—*
Marvola, Martti L. A.; Marttila, Esko V.; Uotila, Jaakko A.; Pippuri, Aino K.; Kairisalo, Pekka J.; and Honkanen, Erkki J., 4,599,326, Cl. 514-29.000.
Urban Engineering Company, Inc.: *See—*
Kleinberg, Larry K.; and Evans, Donald S., 4,598,710, Cl. 128-318.000.
Urbish, Glenn F.: *See—*
Mullen, William B., III; and Urbish, Glenn F., 4,598,972, Cl. 339-258.00R.
USC—Dept. of Materials Science: *See—*
Wittry, David B., 4,599,741, Cl. 378-85.000.
Uskokovic, Milan R.: *See—*
Boris, Alfred; Partridge, John J.; and Uskokovic, Milan R., 4,599,330, Cl. 514-167.000.
USM Corporation: *See—*
Oefinger, Richard W., 4,598,571, Cl. 72-391.000.
Usui Kokusai Sangyo Kabushiki Kaisha: *See—*
Kanesaka, Hiroshi, 4,598,863, Cl. 239-96.000.
Sugao, Keizo, 4,598,937, Cl. 285-55.000.
Uto, Seiryu: *See—*
Torii, Sigeru; Tanaka, Hideo; Sasaoka, Michio; Shiroi, Takashi; and Uto, Seiryu, 4,599,151, Cl. 204-59.00R.
Uyterhoeven, Herman: *See—*
Podszun, Wolfgang; Witte, Josef; Uyterhoeven, Herman; and Goossens, John, 4,599,291, Cl. 430-114.000.
Valenti, Salvatore: *See—*
Heller, Jurg; Kissling, Bruno; Robinson, Tibor; and Valenti, Salvatore, 4,599,087, Cl. 8-495.000.
Valeo: *See—*
Mongin, Michel; and Jaccod, Michel, 4,598,677, Cl. 123-195.00A.
Villata, Gino, 4,598,801, Cl. 188-71.900.
Valutec AG: *See—*
Meyer, Bruno; and Nold, Peter, 4,598,944, Cl. 297-183.000.
Van Mullekom Innovation B.V.: *See—*
Baghuis, Ludovicus H., 4,599,057, Cl. 418-146.000.
VanAppledorn, William: *See—*
Hegel, Robert W.; and VanAppledorn, William, 4,598,574, Cl. 72-481.000.
van Blerk, Victor B., to Verbatim Corporation. Automatic azimuth angle adjustment head mounting structure. 4,599,667, Cl. 360-106.000.
Van Daele, Antoine, to Brock Manufacturing Company. Storage bin lid closing mechanism. 4,598,496, Cl. 49-357.000.

van den Heuvel, Holger H.: *See—*
Bruzzese, Tiberio; Dell'Acqua, Ernani; Ottoni, Franco; and van den Heuvel, Holger H., 4,599,406, Cl. 544-49.000.

Vanderpool, Clarence D.; and MacInnis, Martin B., to GTE Products Corporation. Recovery of molybdenum from molybdenum disulfide. 4,599,224, Cl. 423-606.000.

van der Stoel, Roland E.; and Bosma, Marcel A. R., to Stamicarbon B.V. Process for the preparation of a pyridone-2. 4,599,421, Cl. 546-251.000.

van Hattem, Hendricus W. M.; and Isendam, Jules N., to Amgas B.V. Method of making a fibrous thermally insulating layer of coherent structure, a layer made by this method, and a thermally insulating element provided with such a layer. 4,599,252, Cl. 428-35.000.

Van Horn, William E., II, to CCI Industries. Broiler/griddle. 4,598,634, Cl. 99-340.000.

Van Kanegan, Eugene M. Wide range rotary gear hydrostatic transmission. 4,598,546, Cl. 60-491.000.

Vann, Roy R., to Geo Vann, Inc. Method and apparatus for firing a perforating gun and simultaneously recording the downhole pressure. 4,598,771, Cl. 166-250.000.

Vann, Roy R.; and Colle, Edward A., Jr., to Geo. Vann, Inc. Perforating gun charge carrier improvements. 4,598,775, Cl. 175-4.600.

Varian Associates, Inc.: *See—*
Ray, Curtis, 4,599,169, Cl. 210-175.000.

Varian Techtron Proprietary Limited: *See—*
Wiseman, Alan G.; and Huberts, John T., 4,598,596, Cl. 73-864.220.

Vartuli, James C.: *See—*
Kresge, Charles T.; Vartuli, James C.; and Nicoletti, Michael P., 4,599,475, Cl. 585-481.000.

Vasek, Gilbert J., to AGA AB. Cryogen shot blast deflashing system with bellows return conduit. 4,598,501, Cl. 51-425.000.

Vasilos, Thomas, to Avco Corporation. Self-healing oxidation-resistant carbon structure. 4,599,256, Cl. 428-114.000.

Vaughan, Thomas J., to Micro Communications, Inc. UHF broadcast antenna on a tower with circular waveguide carrying RF energy up the tower to the antenna with polarization adjustments and exclusions. 4,599,744, Cl. 455-129.000.

Veb Leipziger Arzneimittel Werk: *See—*
Dautzenberg, Horst; Loth, Fritz; Borrmeister, Bodo; Bertram, Dieter; Lettau, Herbert; Stamberg, Jiri; and Peska, Jan, 4,599,209, Cl. 264-7.000.

Ventura, Frank D.; and Moormann, Randall H., to CPG Products Corp. Soft game ball including moveable lubricated core. 4,598,909, Cl. 273-60.00B.

Venture Chemicals, Inc.: *See—*
Cowan, Jack C., 4,599,181, Cl. 252-8.50C.

Verbatim Corporation: *See—*
van Blerk, Victor B., 4,599,667, Cl. 360-106.000.

Verboom, Johannes J.: *See—*
Bracht, Rodger R.; and Verboom, Johannes J., 4,599,717, Cl. 369-54.000.

Verdier, Alain; and Polly, Marc, to Black & Decker Inc. Functional unit for a motorized electrical appliance. 4,599,529, Cl. 310-50.000.

Verholt, Johannes M., to B.V. Briefhouder- en Papierwarenfabriek PAS. Pull-out drawer for a filing case. 4,598,958, Cl. 312-189.000.

Verzella, David J.: *See—*
Fischer, William C.; Adams, Don L.; Wright, Stuart C.; and Verzella, David J., 4,599,698, Cl. 364-551.000.

Vickers, Incorporated: *See—*
Walters, Ronald B.; and Hammond, John A. G., 4,598,626, Cl. 91-433.000.

Victor Company of Japan, Limited: *See—*
Muramatsu, Hiroshi, 4,599,661, Cl. 360-96.200.

Viehbeck, Alfred: *See—*
DeBerry, David W.; and Viehbeck, Alfred, 4,599,614, Cl. 340-785.000.

Viel, Vincenzo: *See—*
Tabacchi, Vittorio; and Viel, Vincenzo, 4,598,983, Cl. 351-95.000.

Villata, Gino, to Valeo. Clamping device. 4,598,801, Cl. 188-71.900.

Vincent, Kent: *See—*
Gordon, Gary; and Vincent, Kent, 4,599,049, Cl. 417-205.000.

Viner, George C., to Westinghouse Brake & Signal. Sliding door edge support. 4,598,499, Cl. 49-411.000.

Vio, Lino; and Meunier, Gilles, to Societe Nationale Elf Aquitaine. Process of thermal stabilization of aqueous solutions of polysaccharides and its application to drilling fluids. 4,599,180, Cl. 252-8.55D.

Vipont Laboratories, Inc.: *See—*
Ladanyi, Peter A., 4,599,228, Cl. 424-52.000.

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Young, Raymond R.; and Deffner, John F., 4,598,828, Cl. 211-59.200.

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Hickman, John B., 4,598,507, Cl. 52-94.000.

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Martini, Francesco, 4,599,276, Cl. 428-520.000.

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Weil, Roger: *See*—
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Schloz, Gerhard, 4,598,870, Cl. 239-696.000.
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Alkire, Gerald R.; Frank, Woodrow W., Jr.; and Thompson, Robert W., 4,598,580, Cl. 73-104.000.
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Opdahl, Everett W., 4,598,882, Cl. 244-1.0TD.
Prisco, Anthony J.; and Johnson, Alfred N., 4,599,513, Cl. 250-336.100.
Shum, Lanson Y.; and Ottinger, Brian D., 4,598,942, Cl. 294-106.000.
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Whyde, George J., to File Sharpening Company. Farrier's file/rasp. 4,598,447, Cl. 29-78.000.
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Wiley, Teddy E.; and Payne, James C., to International Paper Company. Corner protector for picture frames and the like. 4,598,825, Cl. 206-453.000.
Wilke, William G., to Tektronix, Inc. Timer calibration method and apparatus. 4,598,575, Cl. 73-5.000.
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ment for threading a paper web through a rotary printing machine. 4,598,850, Cl. 226-92.000.

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Takimoto, Masahiro; Ota, Satoshi; and Yamazaki, Yoshio, 4,599,376, Cl. 524-441.000.

Yano, Kiyotosi: *See—*
Naito, Mitikatu; Yano, Kiyotosi; Itou, Kazuo; Tsuzuki, Kunihiro; Tanaka, Masaaki; and Kawagoe, Michio, 4,598,729, Cl. 137-116.500.

Yasuda, Kikuo; Takezaki, Takayuki; Ohuchi, Rikio; Ohuyabu, Hiroshi; Tanimoto, Yoshitaka; Seki, Toshimi; Yamaguchi, Takashi; Izumi, Akihiro; Himori, Norio; and Ishimori, Tsutomu, to Teikoku Hormone Mfg. Co., Ltd. Hydrazinopyridazine compound, process for production thereof, and use thereof as medicament. 4,599,333, Cl. 514-247.000.

Yazaki, Yoshio; and Ogawa, Shinya, to ORC Manufacturing Co., Ltd. Method of manufacturing printed boards. 4,599,297, Cl. 430-256.000.

Yen, Chia-Ming; Cole, Gerald S.; and Nowicki, Roman M., to Ford Motor Company. Method of controlling metallurgical structure of cast aluminum. 4,598,754, Cl. 164-4.100.

Yen, Jeffrey H., to Mobil Oil Corporation. Cascade hydrodewaxing process. 4,599,162, Cl. 208-59.000.

Yoerger, William E.; and Sorriero, Louis J., to Eastman Kodak Company. Negative charging carrier particles coated with a polymer having appended chlorendate groups. 4,599,290, Cl. 430-108.000.

Yokono, Shigeru; Takahashi, Masatoshi; and Sato, Hideo, to Sony Corporation. Method of producing discharge display device. 4,599,076, Cl. 445-24.000.

Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; and Suyama, Tadakazu, to Green Cross Corporation, The. Perfluoroindolizines and emulsions thereof useful as blood substitutes. 4,599,343, Cl. 514-299.000.

Yokoyama, Yasumasa; Komori, Tomoko; Eida, Tsuyoshi; Koike, Shoji; and Kobayashi, Masatsune, to Canon Kabushiki Kaisha. Recording liquid. 4,599,112, Cl. 106-22.000.

Yonkers, Edward H.; and Ryan, James. Multi-channel pipetter. 4,599,220, Cl. 422-100.000.

Yoshida, Isao; Okabe, Takeaki; Ochi, Shikayuki; Ito, Hidefumi; Furumi, Masatomo; Takeuchi, Masaru; and Nagata, Minoru, to Hitachi, Ltd.

Insulated gate type field effect semiconductor device and a circuit employing the device. 4,599,576, Cl. 330-264.000.
Yoshida, Kobun, to Pioneer Electronic Corporation. Locking device for recorder operation modes. 4,599,665, Cl. 360-105.000.
Yoshida Kogyo K. K.: *See*—
Gartner, Karl, 4,598,513, Cl. 52-206.000.
Takahashi, Kihei, 4,599,065, Cl. 425-394.000.
Yunoki, Akio, 4,598,454, Cl. 29-33.200.
Yoshida, Ryo: *See*—
Nagano, Eiki; and Yoshida, Ryo, 4,599,104, Cl. 71-92.000.
Yoshieda, Keiichi, to Nippon Notion Kogyo Co., Ltd. Apparatus for assembling a pair of fastener elements. 4,598,468, Cl. 29-716.000.
Yoshimura, Tamotsu; Nakamura, Masahiko; and Kasai, Atsushi, to Mitsubishi Chemical Industries Ltd. Wholly aromatic polyester and process for producing the same. 4,599,397, Cl. 528-190.000.
Yoshino Kogyosho Co., Ltd.: *See*—
Hamaguchi, Masami; Taguchi, Toshio; Nozawa, Takamitsu; and Ogawa, Riichi, 4,598,865, Cl. 239-342.000.
Young, Bettie Tippen: *See*—
Tippen, Lesley T., 4,598,783, Cl. 180-9.320.
Young, Peter J.; and Romocki, Julian M. E., to Amerigo Technology Limited. Well treating composition and method. 4,599,182, Cl. 252-8.55C.
Young, Raymond R.; and Deffner, John F., to Visual Marketing, Inc. Storage and dispensing rack. 4,598,828, Cl. 211-59.200.
Young, Rickie A.; Willard, David L.; and Berger, Gerald P., to FMC Corporation. Hydraulic circuit for crane. 4,598,829, Cl. 212-149.000.
Yuasa, Masami: *See*—
Saito, Etsuro; Takahashi, Shinichiro; Yuasa, Masami; and Akiyama, Tsutomu, 4,599,663, Cl. 360-97.000.
Yuda, Mitsuhara: *See*—
Misato, Tomomasa; Homma, Yasuo; Arimoto, Yutaka; Hidaka, Tohoru; and Yuda, Mitsuhara, 4,599,233, Cl. 424-127.000.
Yunoki, Akio, to Yoshida Kogyo K. K. Apparatus for manufacturing slide fasteners with flies. 4,598,454, Cl. 29-33.200.
Yuza, Yasutada: *See*—
Arikawa, Hiroo; and Yuza, Yasutada, 4,599,596, Cl. 337-201.000.
Zakrajsek, Jerome A., to DCI Marketing. Trash receptacle. 4,598,838, Cl. 220-404.000.
Zansky, Zoltan: *See*—
Planer, Norman G.; and Zansky, Zoltan, 4,599,672, Cl. 361-92.000.
Zboray, Michael R.: *See*—
Breen, Robert N.; Day, Robert A., II; Lawrence, Victor B.; and Zboray, Michael R., 4,599,719, Cl. 370-24.000.
Zeiler, Hans-Joachim: *See*—
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,599,334, Cl. 514-253.000.
Zenith Electronics Corporation: *See*—
Ray, Francis M., 4,598,813, Cl. 198-345.000.
Zisserson, Melvin: *See*—
Lewis, Gary K.; and Zisserson, Melvin, 4,599,582, Cl. 331-117.00D.
Zurn, Georg: *See*—
Schiel, Christian; and Zurn, Georg, 4,598,448, Cl. 29-116.0AD.
Zweigart, Gerhard: *See*—
Scholz, Hans-Jurgen; Brambilla, Luigi; Katz, Egon; Bossenmaier, Alban; and Zweigart, Gerhard, 4,598,943, Cl. 296-97.00H.
Zyduck, Ronald L., to Acorn Equipment Corp. Silage-tunneling apparatus. 4,599,029, Cl. 414-297.000.
Zylbert, Thaddeus J., to Singer Company, The. Method for pressing finless sewing machine needles. 4,598,753, Cl. 163-5.000.
501 Pella B. V. Pannigen: *See*—
Peeters-Weem, Petrus J., 4,598,751, C. 160-84.00R.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF JULY, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bradley, David J., to International Business Machines Corporation. Apparatus and method for reading and writing text characters in a graphics display. Re. 32,201, Cl. 340-747.000.

Carlson, Dana P., to Du Pont de Nemours, E. I., and Company. Tough, stable tetrafluoroethylene-fluoroalkyl perfluorovinyl ether copolymers. Re. 32,199, Cl. 526-206.000.

Control Components, Inc.: *See—*
Self, Richard E., Re. 32,197, Cl. 251-127.000.

Domitrowich, Joseph: *See—*
Lee, Yong K.; Domitrowich, Joseph; and Gordon, James S., Re. 32,200, Cl. 365-229.000.

Du Pont de Nemours, E. I., and Company: *See—*
Carlson, Dana P., Re. 32,199, Cl. 526-206.000.

Durakon, Inc.: *See—*
Wayne, Michael, Re. 32,198, Cl. 296-39.00R.

Fairchild Semiconductor Corporation: *See—*
Lee, Yong K.; Domitrowich, Joseph; and Gordon, James S., Re. 32,200, Cl. 365-229.000.

Gordon, James S.: *See—*
Lee, Yong K.; Domitrowich, Joseph; and Gordon, James S., Re. 32,200, Cl. 365-229.000.

International Business Machines Corporation: *See—*
Bradley, David J., Re. 32,201, Cl. 340-747.000.

Lee, Yong K.; Domitrowich, Joseph; and Gordon, James S., to Fairchild Semiconductor Corporation. MOS battery backup controller for microcomputer random access memory. Re. 32,200, Cl. 365-229.000.

Self, Richard E., to Control Components, Inc. High energy loss fluid control. Re. 32,197, Cl. 251-127.000.

Wayne, Michael, to Durakon, Inc. Truck bed liner. Re. 32,198, Cl. 296-39.00R.

LIST OF DESIGN PATENTEES

AB Verktyg & Press: *See—*
Runbjork, Bo, 284,586, Cl. D19-69.000.

Affaril Handelsanstalt: *See—*
Schuck, Peter, 284,591, Cl. D21-20.000.

Ainsworth, Dennis. Ornamental belt buckle. 284,524, 7-8-86, Cl. D2-427.000.

Alvarez, Richard: *See—*
Pashley, Robert; Burke, Mary E.; Peters, William; Jacobi, Robert L.; Gangelhoff, Ronald J.; Lewis, Leonard E.; and Alvarez, Richard, 284,537, Cl. D7-152.000.

Anchor Hocking Corporation: *See—*
Gobleck, Peter A., Jr., 284,535, Cl. D7-6.000.

Ando, Teturo, to Kabushikikaisha Taikodenki Seisakusho. Telephone. 284,573, 7-8-86, Cl. D14-58.000.

Anz, Gerald W., to Talkin' Turkey Telephone Company. Telephone base. 284,569, 7-8-86, Cl. D14-53.000.

Aspri Sports, Inc.: *See—*
Lowe, Ralph L., Jr.; and Elliott, Patrick S., 284,518, Cl. D2-310.000.

Bang, Gary M.: *See—*
Smith, David B.; and Bang, Gary M., 284,597, Cl. D21-195.000.

Bartasevich, William E., to Meyer Company, The. Handle for a utensil lid. 284,541, 7-8-86, Cl. D7-393.000.

Baumgarten, Rolf, to Heinrich Baumgarten KG Eisen und Blechwarenfabrik. Handle for cooking utensils. 284,539, 7-8-86, Cl. D7-393.000.

Baumgarten, Rolf, to Heinrich Baumgarten KG Eisen und Blechwarenfabrik. Handle for cooking utensils. 284,540, 7-8-86, Cl. D7-393.000.

Beckon, Weir E. Diesel engine air filter mount. 284,576, 7-8-86, Cl. D15-5.000.

Berry, Richard D., Jr., to Design Institute America, Inc. Table. 284,533, 7-8-86, Cl. D6-478.000.

Bosch-Siemens Hausgerate GmbH: *See—*
Friz, Albrecht, 284,538, Cl. D7-354.000.

Bosko, Joseph L., to Kershaw Manufacturing Company, Inc. Railway track broom machine. 284,558, 7-8-86, Cl. D12-36.000.

Bosko, Joseph L., to Kershaw Manufacturing Company, Inc. Railway track broom machine with cab. 284,559, 7-8-86, Cl. D12-36.000.

Braga, Richard A.; Przygoda, Carole A.; Lacerte, Richard F.; and Swain, Douglas S., to United States of America, Army. Sole for footwear. 284,519, 7-8-86, Cl. D2-320.000.

Bridgestone Tire Co., Ltd.: *See—*
Kojima, Hiroshi; Kawabata, Misao; Obata, Kazuo; and Ushikubo, Hisao, 284,562, Cl. D12-147.000.

Bruhn, Bernhard, to Koh-I-Noor Rapidograph, Inc. Fountain pen for artists and calligraphers or the like. 284,582, 7-8-86, Cl. D19-48.000.

Burgess, Kenneth W., to E.C.K. Manufacturing Co. Limited, The. Putter head. 284,600, 7-8-86, Cl. D21-219.000.

Burke, Mary E.: *See—*
Pashley, Robert; Burke, Mary E.; Peters, William; Jacobi, Robert L.; Gangelhoff, Ronald J.; Lewis, Leonard E.; and Alvarez, Richard, 284,537, Cl. D7-152.000.

Century Boat Company: *See—*
Hegg, Allan B.; Makowski, Lloyd S.; and Phares, James S., 284,566, Cl. D12-313.000.

Chicago Cutlery Consumer Products, Inc.: *See—*
Pashley, Robert; Burke, Mary E.; Peters, William; Jacobi, Robert L.; Gangelhoff, Ronald J.; Lewis, Leonard E.; and Alvarez, Richard, 284,537, Cl. D7-152.000.

Cochran, Ken C. Combined basketball game goal and return net. 284,599, 7-8-86, Cl. D21-201.000.

Coin Controls, Inc.: *See—*
Happ, Frank L., 284,593, Cl. D21-48.000.

Collister, Kenneth D., to Miles Laboratories, Inc. Closure for containers. 284,553, 7-8-86, Cl. D9-435.000.

Comdial Consumer Communications Corporation: *See—*
Perkins, George D., 284,572, Cl. D14-53.000.

Cotney, Garland D.; and Taylor, Scot W., to Motorola, Inc. Parts tray. 284,611, 7-8-86, Cl. D34-40.000.

Cox, David J.; Hunninghaus, Roy E.; Meyer, Keith D.; and Wozniczka, George, to Motorola, Inc. Combined electronic enclosure and heat sink apparatus or similar article. 284,567, 7-8-86, Cl. D13-15.000.

Daavlin Company: *See—*
Swanson, David W.; and Swanson, Linda C., 284,605, Cl. D24-39.000.

Davis, Myron F., to International Business Machines Corporation. Carrying case for a personal computer. 284,527, 7-8-86, Cl. D3-76.000.

Design Institute America, Inc.: *See—*
Berry, Richard D., Jr., 284,533, Cl. D6-478.000.

Dickinson, Peter D.: *See—*
Drews, John G.; Dickinson, Peter D.; and Stephan, Donald C., 284,592, Cl. D21-38.000.

Doi, Tetsuyuki: *See—*
Kawakami, Hideki; and Doi, Tetsuyuki, 284,546, Cl. D8-66.000.

Donahue, Juanita M. Gameboard. 284,590, 7-8-86, Cl. D21-17.000.

Double D Specialties, Inc.: *See—*
Trombley, Ulric W.; and Nozel, Richard J., 284,565, Cl. D12-190.000.

Drews, John G.; Dickinson, Peter D.; and Stephan, Donald C., to IGT. Electronic game machine or similar article. 284,592, 7-8-86, Cl. D21-38.000.

DuBose, Robert J. Housing for hydraulic power unit for a loader attachment. 284,577, 7-8-86, Cl. D15-28.000.

Dyer, Robert B., to Vulcan Athletic Service Company, Inc. Shoulder pads for football players. 284,516, 7-8-86, Cl. D2-27.000.

E.C.K. Manufacturing Co. Limited, The: *See—*
Burgess, Kenneth W., 284,600, Cl. D21-219.000.

Ekco Housewares, Inc.: *See—*
Kelly, Roger L., 284,536, Cl. D7-74.000.
Kelly, Roger L., 284,542, Cl. D7-395.000.

Eli Lilly and Company: *See—*
Rosen, Marc A., 284,548, Cl. D9-377.000.

Elliott, Patrick S.: *See—*
Lowe, Ralph L., Jr.; and Elliott, Patrick S., 284,518, Cl. D2-310.000.

Ferenc, Robert A., to Whelen Engineering Co Inc. Warning light system for vehicles. 284,557, 7-8-86, Cl. D10-114.000.

Fischer, Roy K., to International Telephone & Telegraph Corp. Keyboard or similar article. 284,574, 7-8-86, Cl. D14-100.000.

Fisher, Robert C., to Quaker Oats Company, The. Toy helicopter. 284,594, 7-8-86, Cl. D21-85.000.

Forrest Mountaineering, Ltd.: *See*—
Forrest, William E., 284,521, Cl. D2-405.000.
Forrest, William E., to Forrest Mountaineering, Ltd. T-fitting for a mountain climber's sling. 284,521, 7-8-86, Cl. D2-405.000.
Franek, Jozef I.; and Irvine, Keith R., to Metal Box Public Limited Company. Can or similar article. 284,551, 7-8-86, Cl. D9-428.000.
Freeman, Nettie A. Portable desk. 284,526, 7-8-86, Cl. D3-74.000.
Friz, Albrecht, to Bosch-Siemens Hausgerate GmbH. Coffee roaster. 284,538, 7-8-86, Cl. D7-354.000.
Gangelhoff, Ronald J.: *See*—
Pashley, Robert; Burke, Mary E.; Peters, William; Jacobi, Robert L.; Gangelhoff, Ronald J.; Lewis, Leonard E.; and Alvarez, Richard, 284,537, Cl. D7-152.000.
Gillette Company, The: *See*—
Zierhut, Clarence, 284,583, Cl. D19-57.000.
Zierhut, Clarence, 284,584, Cl. D19-57.000.
Zierhut, Clarence, 284,585, Cl. D19-57.000.
Gobleck, Peter A., Jr., to Anchor Hocking Corporation. Tumbler or similar article. 284,535, 7-8-86, Cl. D7-6.000.
Gray, Scott S. Hat. 284,517, 7-8-86, Cl. D2-254.000.
Hampton, William D. Pair of brackets for holding a plastic bag. 284,608, 7-8-86, Cl. D34-6.000.
Handler, Carol. Pot holder for arthritic persons. 284,520, 7-8-86, Cl. D2-361.100.
Happ, Frank L., to Coin Controls, Inc. Joystick control for video games and computer systems. 284,593, 7-8-86, Cl. D21-48.000.
Harris, Frances T.: *See*—
Harris, Garrett R.; and Harris, Frances T., 284,610, Cl. D34-27.000.
Harris, Garrett R.; and Harris, Frances T. Clipboard attachment for shopping carts. 284,610, 7-8-86, Cl. D34-27.000.
Hegg, Allan B.; Makowski, Lloyd S.; and Phares, James S., to Century Boat Company. Boat. 284,566, 7-8-86, Cl. D12-313.000.
Heinrich Baumgarten KG Eisen und Blechwarenfabrik: *See*—
Baumgarten, Rolf, 284,539, Cl. D7-393.000.
Baumgarten, Rolf, 284,540, Cl. D7-393.000.
Hentschel, Harry, to Siemens Aktiengesellschaft. Telephone instrument or similar article. 284,570, 7-8-86, Cl. D14-53.000.
Herndon, John F. Cupid-unicorn (cupicorn) the love unicorn. 284,595, 7-8-86, Cl. D21-165.000.
Huls, Ronald. Frying pan grease drain insert. 284,543, 7-8-86, Cl. D7-409.000.
Hunninghaus, Roy E.: *See*—
Cox, David J.; Hunninghaus, Roy E.; Meyer, Keith D.; and Wozniczka, George, 284,567, Cl. D13-15.000.
Huwood-Irwin Co.: *See*—
O'Lear, Joseph L., 284,560, Cl. D12-46.000.
IGT: *See*—
Drews, John G.; Dickinson, Peter D.; and Stephan, Donald C., 284,592, Cl. D21-38.000.
Interdica S.A.: *See*—
Kanoui, Joseph, 284,556, Cl. D10-39.000.
International Business Machines Corporation: *See*—
Davis, Myron F., 284,527, Cl. D3-76.000.
International Telephone & Telegraph Corp.: *See*—
Fischer, Roy K., 284,574, Cl. D14-100.000.
Io, Fumitaka; and Takarabe, Yuuji, to Minolta Camera Kabushiki Kaisha. Photographic camera or similar article. 284,579, 7-8-86, Cl. D16-6.000.
Irvine, Keith R.: *See*—
Franek, Jozef I.; and Irvine, Keith R., 284,551, Cl. D9-428.000.
Jacobi, Robert L.: *See*—
Pashley, Robert; Burke, Mary E.; Peters, William; Jacobi, Robert L.; Gangelhoff, Ronald J.; Lewis, Leonard E.; and Alvarez, Richard, 284,537, Cl. D7-152.000.
James, Houston F. Display board assembly. 284,589, 7-8-86, Cl. D20-42.000.
Jurado, Nelly M. Toothbrush. 284,528, 7-8-86, Cl. D4-105.000.
K.A.S. Manufacturing, Inc.: *See*—
Kopecky, Ivyl D., 284,564, Cl. D12-182.000.
Kabushikikaisha Taikodenki Seisakusho: *See*—
Ando, Teturo, 284,573, Cl. D14-58.000.
Kahute, Robert M.: *See*—
Nelson, John M.; and Kahute, Robert M., 284,545, Cl. D8-30.000.
Nelson, John M.; and Kahute, Robert M., 284,554, Cl. D8-30.000.
Kanoui, Joseph, to Interdica S.A. Combined watch and bracelet. 284,556, 7-8-86, Cl. D10-39.000.
Kawabata, Misao: *See*—
Kojima, Hiroshi; Kawabata, Misao; Obata, Kazuo; and Ushikubo, Hisao, 284,562, Cl. D12-147.000.
Kawakami, Hideki; and Doi, Tetsuyuki, to Ryobi Ltd. Cutter. 284,546, 7-8-86, Cl. D8-66.000.
Kelly, Roger L., to Ekco Housewares, Inc. Knife holder. 284,536, 7-8-86, Cl. D7-74.000.
Kelly, Roger L., to Ekco Housewares, Inc. Handle for a culinary tool. 284,542, 7-8-86, Cl. D7-395.000.
Kershaw Manufacturing Company, Inc.: *See*—
Bosko, Joseph L., 284,558, Cl. D12-36.000.
Bosko, Joseph L., 284,559, Cl. D12-36.000.
Kirk, Alexis V., to Somersett Moon Ltd. Belt buckle. 284,523, 7-8-86, Cl. D2-422.000.
Koh-I-Noor Rapidograph, Inc.: *See*—
Bruhn, Bernhard, 284,582, Cl. D19-48.000.
Kojima, Hiroshi; Kawabata, Misao; Obata, Kazuo; and Ushikubo, Hisao, to Bridgestone Tire Co., Ltd. Automobile tire. 284,562, 7-8-86, Cl. D12-147.000.
Kolb, Walter, to Wolf-Gerate GmbH. Gardening implement. 284,544, 7-8-86, Cl. D8-11.000.
Koontz, Daniel M. Container for tobacco products. 284,606, 7-8-86, Cl. D27-47.000.
Kopecky, Ivyl D., to K.A.S. Manufacturing, Inc. Combined motorcycle fairing bug deflector and mounting bracket. 284,564, 7-8-86, Cl. D12-182.000.
Lacerte, Richard F.: *See*—
Braga, Richard A.; Przygoda, Carole A.; Lacerte, Richard F.; and Swain, Douglas S., 284,519, Cl. D2-320.000.
Latas, Michael. Vehicle fender liner. 284,575, 7-8-86, Cl. D12-184.000.
LeMaistre, Charles J. Baby and infant carrier. 284,525, 7-8-86, Cl. D3-31.000.
Lever Brothers Company: *See*—
Schornagel, Pieter, 284,555, Cl. D9-453.000.
Lewis, Leonard E.: *See*—
Pashley, Robert; Burke, Mary E.; Peters, William; Jacobi, Robert L.; Gangelhoff, Ronald J.; Lewis, Leonard E.; and Alvarez, Richard, 284,537, Cl. D7-152.000.
Loignon, Edward G. Syphon fitting. 284,603, 7-8-86, Cl. D23-40.000.
Lowe, Ralph L., Jr.; and Elliott, Patrick S., to Aspri Sports, Inc. Shoe. 284,518, 7-8-86, Cl. D2-310.000.
Makowski, Lloyd S.: *See*—
Hegg, Allan B.; Makowski, Lloyd S.; and Phares, James S., 284,566, Cl. D12-313.000.
Manufacture Metallurgique de Tournus: *See*—
Vaussanvin, Marcel, 284,549, Cl. D9-384.000.
Marshall, Eric J., to Marshall Telephone Corporation Limited, The. Telephone set. 284,571, 7-8-86, Cl. D14-53.000.
Marshall Telephone Corporation Limited, The: *See*—
Marshall, Eric J., 284,571, Cl. D14-53.000.
Maruzen Sewing Machine Co., Ltd.: *See*—
Yoneda, Yoshihide, 284,578, Cl. D15-72.000.
Mathis, Cleo D. Air control apparatus. 284,604, 7-8-86, Cl. D23-41.000.
Matney, Roby N. Wad carrier. 284,602, 7-8-86, Cl. D3-100.000.
McMurtrey, David K.: *See*—
Pawsat, Carlton P.; and McMurtrey, David K., 284,561, Cl. D12-125.000.
McNeil, Ronald A., to R.A.M. Innovations, Inc. Yoke for an exercise bicycle. 284,596, 7-8-86, Cl. D21-194.000.
Merino, Dennis. Cup lid. 284,563, 7-8-86, Cl. D9-451.000.
Metal Box Public Limited Company: *See*—
Franek, Jozef I.; and Irvine, Keith R., 284,551, Cl. D9-428.000.
Meyer Company, The: *See*—
Bartasevich, William E., 284,541, Cl. D7-393.000.
Meyer, Keith D.: *See*—
Cox, David J.; Hunninghaus, Roy E.; Meyer, Keith D.; and Wozniczka, George, 284,567, Cl. D13-15.000.
Miles Laboratories, Inc.: *See*—
Collister, Kenneth D., 284,553, Cl. D9-435.000.
Minolta Camera Kabushiki Kaisha: *See*—
Io, Fumitaka; and Takarabe, Yuuji, 284,579, Cl. D16-6.000.
Montenecourt, Gene E. Table leg or similar article. 284,534, 7-8-86, Cl. D6-495.000.
Motorola, Inc.: *See*—
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Cox, David J.; Hunninghaus, Roy E.; Meyer, Keith D.; and Wozniczka, George, 284,567, Cl. D13-15.000.
Muller, Ronald L., to North American Philips Corporation. Body washing implement with brush and sponge heads. 284,607, 7-8-86, Cl. D28-63.000.
Nakayo Telecommunications, Inc.: *See*—
Yamagami, Yoku; and Takatsuka, Sadao, 284,568, Cl. D14-53.000.
Nally, Phillip L. Inventor's recognition plate. 284,587, 7-8-86, Cl. D20-14.000.
Nelson, John M.; and Kahute, Robert M., to Newell Companies, Inc. Housing for self-igniting gas torch. 284,545, 7-8-86, Cl. D8-30.000.
Nelson, John M.; and Kahute, Robert M., to Newell Companies, Inc. Housing for self-igniting gas torch. 284,554, 7-8-86, Cl. D8-30.000.
Newell Companies, Inc.: *See*—
Nelson, John M.; and Kahute, Robert M., 284,545, Cl. D8-30.000.
Nelson, John M.; and Kahute, Robert M., 284,554, Cl. D8-30.000.
North American Philips Corporation: *See*—
Muller, Ronald L., 284,607, Cl. D28-63.000.
Nozel, Richard J.: *See*—
Trombley, Ulric W.; and Nozel, Richard J., 284,565, Cl. D12-190.000.
Obata, Kazuo: *See*—
Kojima, Hiroshi; Kawabata, Misao; Obata, Kazuo; and Ushikubo, Hisao, 284,562, Cl. D12-147.000.
O'Lear, Joseph L., to Huwood-Irwin Co. Truck for a rail traversing car. 284,560, 7-8-86, Cl. D12-46.000.
Parrack, Dennis, to Procter & Gamble Company, The. Bottle. 284,550, 7-8-86, Cl. D9-395.000.
Pashley, Robert; Burke, Mary E.; Peters, William; Jacobi, Robert L.; Gangelhoff, Ronald J.; Lewis, Leonard E.; and Alvarez, Richard, to Chicago Cutlery Consumer Products, Inc. Knife handle. 284,537, 7-8-86, Cl. D7-152.000.
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Perkins, George D., to Comdial Consumer Communications Corporation. Telephone apparatus. 284,572, 7-8-86, Cl. D14-53.000.
Peters, William: *See*—
Pashley, Robert; Burke, Mary E.; Peters, William; Jacobi, Robert L.; Gangelhoff, Ronald J.; Lewis, Leonard E.; and Alvarez, Richard, 284,537, Cl. D7-152.000.

Peterson, Alfred L. Emergency microfilmed medical and identification record. 284,581, 7-8-86, Cl. D19-10.000.

Phares, James S.: *See*—
Hegg, Allan B.; Makowski, Lloyd S.; and Phares, James S., 284,566, Cl. D12-313.000.

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Smith, David B.; and Bang, Gary M., 284,597, Cl. D21-195.000.

Procter & Gamble Company, The: *See*—
Parrack, Dennis, 284,550, Cl. D9-395.000.

Przygoda, Carole A.: *See*—
Braga, Richard A.; Przygoda, Carole A.; Lacerte, Richard F.; and Swain, Douglas S., 284,519, Cl. D2-320.000.

Quaker Oats Company, The: *See*—
Fisher, Robert C., 284,594, Cl. D21-85.000.
Riehm, Merry S., 284,530, Cl. D6-384.000.
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McNeil, Ronald A., 284,596, Cl. D21-194.000.

Reed, Adrian M., to Robert George Banks. Folding stool. 284,529, 7-8-86, Cl. D6-353.000.

Rhea, Bradford H.: *See*—
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Rosen, Marc A., to Eli Lilly and Company. Fragrance container. 284,548, 7-8-86, Cl. D9-377.000.

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Kawakami, Hideki; and Doi, Tetsuyuki, 284,546, Cl. D8-66.000.

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Hentschel, Harry, 284,570, Cl. D14-53.000.

Silver, William V., to Thomson-Leeds Company, Inc. Retail store advertising display. 284,588, 7-8-86, Cl D20-42.000.

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Kirk, Alexis V., 284,523, Cl. D2-422.000.

Spencer, Treesa A. Lockable holder for containers. 284,547, 7-8-86, Cl. D8-373.000.

Stephan, Donald C.: *See*—
Drews, John G.; Dickinson, Peter D.; and Stephan, Donald C., 284,592, Cl. D21-38.000.

Swain, Douglas S.: *See*—
Braga, Richard A.; Przygoda, Carole A.; Lacerte, Richard F.; and Swain, Douglas S., 284,519, Cl. D2-320.000.

Swanson, David W.; and Swanson, Linda C., to Daavlin Company. Phototherapy cabinet. 284,605, 7-8-86, Cl. D24-39.000.

Swanson, Linda C.: *See*—
Swanson, David W.; and Swanson, Linda C., 284,605, Cl. D24-39.000.

Takarabe, Yuuji: *See*—
Io, Fumitaka; and Takarabe, Yuuji, 284,579, Cl. D16-6.000.

Takatsuka, Sadao: *See*—
Yamagami, Yoku; and Takatsuka, Sadao, 284,568, Cl. D14-53.000.

Talkin' Turkey Telephone Company: *See*—
Anz, Gerald W., 284,569, Cl. D14-53.000.

Taylor, Scot W.: *See*—
Cotney, Garland D.; and Taylor, Scot W., 284,611, Cl. D34-40.000.

Thomson-Leeds Company, Inc.: *See*—
Silver, William V., 284,588, Cl. D20-42.000.

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Weaver, Ronald, 284,552, Cl. D9-433.000.

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Voko Franz Vogt & Co.: *See*—
Vogt, Franz, 284,532, Cl. D6-428.000.

Vulcan Athletic Service Company, Inc.: *See*—
Dyer, Robert B., 284,516, Cl. D2-27.000.

Waite, Mark E.: *See*—
Wisdom, Victor L.; Waite, Mark E.; and Rhea, Bradford H., 284,601, Cl. D21-242.000.

Wald Manufacturing Co., Inc.: *See*—
Pawsat, Carlton P.; and McMurtrey, David K., 284,561, Cl. D12-125.000.

Weaver, Ronald, to Ti Bottle & Packaging Services Limited. Blank for a carton. 284,552, 7-8-86, Cl. D9-433.000.

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Ferenc, Robert A., 284,557, Cl. D10-114.000.

Wisdom Manufacturing, Inc.: *See*—
Wisdom, Victor L.; Waite, Mark E.; and Rhea, Bradford H., 284,601, Cl. D21-242.000.

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ISSUED JULY 8, 1986

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2.1 A 4,598,427
4,598,428
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CLASS 4

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200.26 4,598,705
205.24 4,598,706
207.15 4,598,707
303 R 4,598,708
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334 C 4,598,712
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251 4,598,772
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6 R 4,598,805
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185 4,598,859

CLASS 229

69 4,598,860

CLASS 235

116 4,599,508
382 4,599,509
449 4,599,510
459 4,599,511

CLASS 236

59 4,598,861

CLASS 239

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96 4,598,863
152 4,598,864
342 4,598,865
447 4,598,866
453 4,598,867
659 4,598,868
696 4,598,870
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19 4,598,872
21 4,598,873
37.5 4,598,874
78 4,598,875

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66 4,598,877
84.1 A 4,598,878
84.5 R 4,598,879
164 4,598,880

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1 TD 4,598,882
3.16 4,598,884
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15 4,598,886
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230 4,598,890

CLASS 248

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406.2 4,598,892
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615 4,598,894

CLASS 250

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336.1 4,599,513
359.1 4,599,514
390 4,599,515
443.1 4,599,516
506.1 4,599,517
507.1 4,599,518

CLASS 251

78 4,598,895
127 Re.32,197
149.6 4,598,896

CLASS 252

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8.55 C 4,599,182
8.55 D 4,599,180
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518 4,599,194
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93 H 4,598,898

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507 R 4,599,204
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CLASS 261

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CLASS 264

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40.5 4,599,210
82 4,599,211
255 4,599,212

CLASS 266

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CLASS 267

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CLASS 271

202 4,598,901
205 4,598,902
264 4,598,903

CLASS 272

65 4,598,904
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103 4,598,906
117 4,598,907
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CLASS 273

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186 A 4,598,911
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80 4,598,914
207 A 4,598,915

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1 M 4,598,916

CLASS 280

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79.1 R 4,598,919
236 4,598,920
242 WC 4,598,921
250 4,598,945
279 4,598,922
287 4,598,923
408 4,598,924
425 A 4,598,925
459 4,598,926
611 4,598,927
618 4,598,928
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CLASS 283

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18 4,598,936
55 4,598,937
382.2 4,598,938

CLASS 292

92 4,598,939
108 4,598,940
134 4,598,941

CLASS 294

106 4,598,942

CLASS 296

39 R Re.32,198
97 H 4,598,943

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114 4,598,955

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578 4,599,520

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CLASS 312

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CLASS 313

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493 4,599,536
501 4,599,537
512 4,599,538
525 4,599,539
570 4,599,540

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CLASS 315

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59 4,599,542
73 4,599,543
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77 G 4,599,567
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158 R 4,599,558
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208 4,599,561
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258 4,599,575
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298 4,599,578

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CLASS 333

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176 4,599,587

CLASS 335

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216 4,599,592
274 4,599,593

CLASS 336

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17 M 4,598,960
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756 4,599,623

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351 4,598,978
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505 4,598,981
626 4,598,982

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219 4,598,984

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380 4,598,999
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419 4,599,001

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23.13 4,599,639
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4,599,637
38 4,599,633
40 4,599,634
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76 4,599,636

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50 4,599,640
65 4,599,642
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96.4 4,599,662
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4,599,664
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132 4,599,669
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197 4,599,009

CLASS 403

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407.1 4,599,011

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72 4,599,013
225 4,599,014

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66 4,599,015
67 4,599,016
95 4,599,017

CLASS 408

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84 4,599,022
233 4,599,023

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126 4,599,026
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297 4,599,029
460 4,599,030
507 4,599,031
542 4,599,032
589 4,599,033
678 4,599,034
697 4,599,035
730 4,599,036
752 4,599,037
783 4,599,038
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204 4,599,042

CLASS 416

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85 4,599,048
205 4,599,049
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456 4,599,054
477 4,599,055

CLASS 418

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221 4,599,058
236 4,599,059

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CLASS 422

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61 4,599,218
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100 4,599,220

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606 4,599,224
659 4,599,225

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1 4,599,060
41 4,599,061
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150 4,599,063
185 4,599,064
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557 4,599,238
590 4,599,239
634 4,599,240

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74 4,599,244
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40 4,599,253
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204 4,599,259
207 4,599,260
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215 4,599,262
225 4,599,263
264 4,599,264
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355 4,599,265
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694 4,599,280
699 4,599,281

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99 4,599,283
191 4,599,284

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4,599,287
63 4,599,288
98 4,599,289
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203 4,599,296
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411 4,599,300
505 4,599,301
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CLASS 431

329 4,599,066

CLASS 432

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97 4,599,068
253 4,599,069

CLASS 434

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7 4,599,304
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543 4,599,318

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CLASS 445

24 4,599,076

CLASS 446

85 4,599,077
95 4,599,078

CLASS 455

129 4,599,744
207 4,599,743
612 4,599,745

CLASS 474

80 4,599,079

CLASS 493

267 4,599,080

CLASS 501

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96 4,599,320

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150 4,599,322
161 4,599,323

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557 4,599,359
570 4,599,360
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516 4,599,377
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68 4,599,380
104 4,599,381
139 4,599,382
180 4,599,383
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326.2 4,599,386
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CLASS 526

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318.6 4,599,392

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462 4,599,437
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313 4,599,202

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421 4,599,456
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622 4,599,477
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650 4,599,480
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90 4,599,082

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2 4,599,081
3 4,599,083
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17 4,599,086

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	254	284,517		428	284,532		373	284,547		182	284,564	D17—	20	284,580		194	284,596
	310	284,518		478	284,533	D9—	377	284,548		184	284,575	D19—	10	284,581		195	284,597
	320	284,519		495	284,534		384	284,549		190	284,565		48	284,582		201	284,598
	361.1	284,520	D7—	6	284,535		395	284,550		313	284,566		57	284,583			284,599
	403	284,521		74	284,536		428	284,551	D13—	15	284,567			284,584		219	284,600
	406	284,522		152	284,537		433	284,552	D14—	53	284,568			284,585		242	284,601
	422	284,523		354	284,538		435	284,553			284,569		69	284,586	D23—	40	284,603
	427	284,524		393	284,539		451	284,563			284,570	D20—	14	284,587		41	284,604
D3—	31	284,525			284,540		453	284,555			284,571		42	284,588	D24—	39	284,605
	74	284,526			284,541	D10—	39	284,556			284,572			284,589	D27—	47	284,606
	76	284,527		395	284,542		114	284,557		58	284,573	D21—	17	284,590	D28—	63	284,607
	100	284,602		409	284,543	D12—	36	284,558		100	284,574		20	284,591	D34—	6	284,608
D4—	105	284,528	D8—	11	284,544			284,559	D15—	5	284,576		38	284,592		17	284,609
D6—	353	284,529		30	284,545		46	284,560		28	284,577		48	284,593		27	284,610
	384	284,530			284,554		125	284,561		72	284,578		85	284,594		40	284,611

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,598,558
4,598,597
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